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CTPS TECHNICAL REPORT

49

USER'S GUIDE TO THE CTPS REGIONAL TRANSIT NETWORK

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April 1985

CTPS TECHNICAL REPORT **49**

TITLE USER'S GUIDE TO THE CTPS
REGIONAL TRANSIT NETWORK

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DATE APRIL 1985

ABSTRACT

This report presents a computer-processible inventory of Eastern Massachusetts transit services. Included are commuter rail, rail rapid transit, and local and express bus service of the Massachusetts Bay Transportation Authority, and private-carrier bus service operated on a regularly scheduled basis. The inventory data set is compatible with the Urban Transportation Planning System (UTPS) program package. Use of the UTPS program with the data set, for network development and path determination, is described.

This document was prepared by CENTRAL TRANSPORTATION PLANNING STAFF, an interagency transportation planning staff created and directed by the Metropolitan Planning Organization, consisting of the member agencies.

Executive Office of Transportation and Construction
Massachusetts Bay Transportation Authority
Massachusetts Department of Public Works
MBTA Advisory Board
Massachusetts Port Authority
Metropolitan Area Planning Council

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MAPC REGION
BOUNDARY

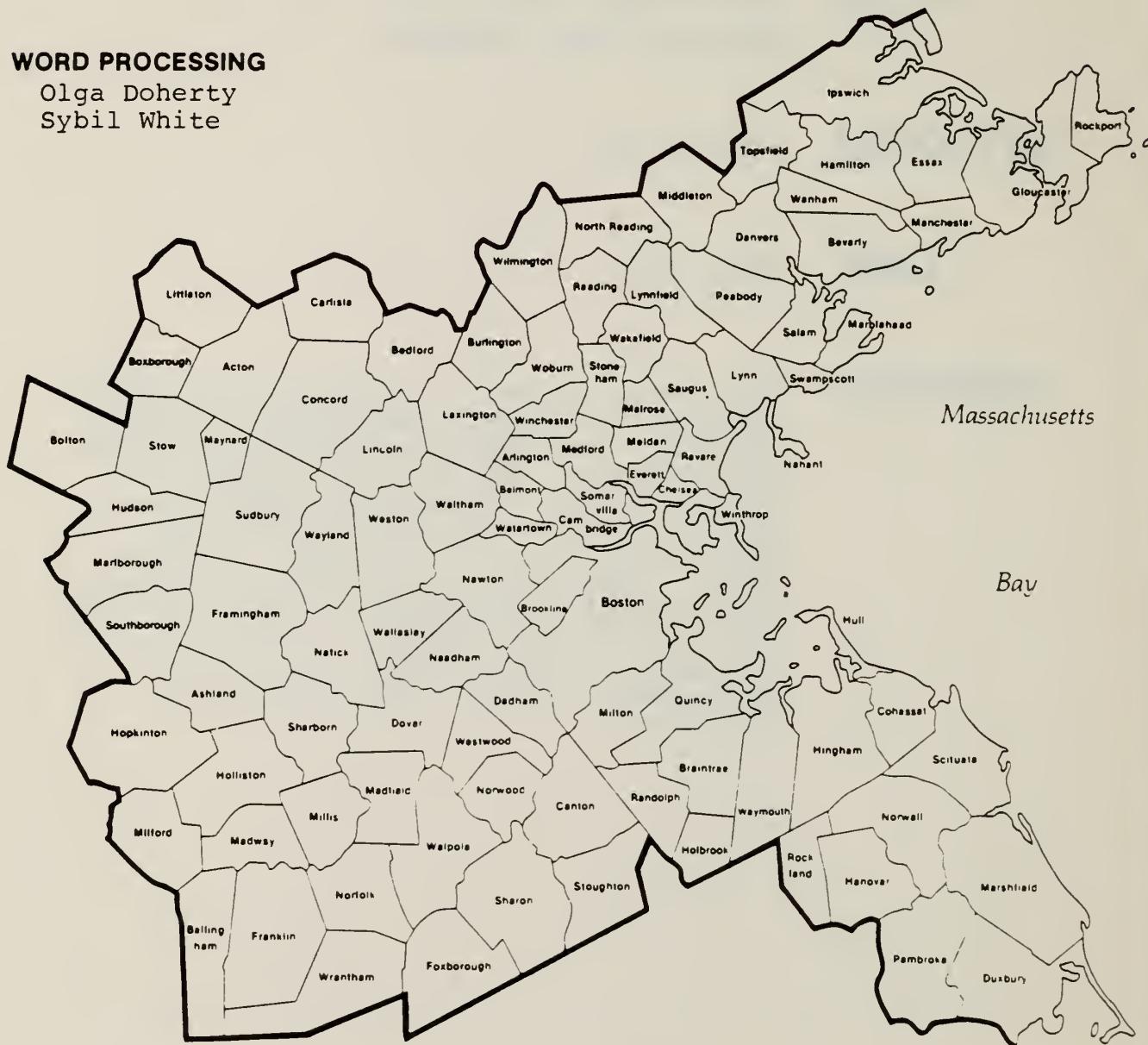
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This document was prepared in cooperation with the Urban Mass Transportation Administration of the U. S. Department of Transportation through the technical study grant(s) cited below, and was also financed with state and local matching funds.

MA-09-0084
MA-09-0095
MA-09-0107
MA-08-0115

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES	v
ACKNOWLEDGMENTS	vii
SUMMARY	ix
1.0 INTRODUCTION	1
2.0 TRANSIT NETWORK DEVELOPMENT BACKGROUND	3
3.0 UTPS PROGRAM UNET	7
4.0 DESCRIPTION OF THE TRANSIT SERVICES CODED	11
4.1 Commuter Rail (Mode 4)	11
4.2 Rail Rapid Transit (Mode 5)	11
4.3 Non-MBTA Local Bus (Mode 6)	13
4.4 MBTA Local Buses and Trackless Trolleys (Mode 7)	13
4.5 Express Buses, MBTA and Private (Mode 8)	15
4.6 Bus Speed Determination	16
5.0 USER'S GUIDE TO TRANSIT NETWORKS	18
5.1 Outline of User's Guide Information	18
5.2 Copying and Creating Data Sets	18
5.3 Modifying Data Sets	18
5.3.1 UNET Editing Process	19
5.3.2 UPNET Program Editing Process	19
5.3.3 Alternative Method of Editing Data Sets	20
5.4 Using the UNET Program	21
5.5 Using the UPATH Program	21
APPENDICES (see page iv)	

APPENDICES	23
A. REFERENCES	25
A.1 UMTA and FHWA References	25
A.2 Selected General References on Transportation	25
A.3 Special References	26
A.4 Special Computer-Related References	27
A.5 Map References	28
B. CODING FORMS USED IN TRANSIT INVENTORY	29
B.1 Coordinate Data Card	30
B.2 Figure V-1: Transit Link Data Card	31
B.3 Figure V-2: Transit Line Data Card	32
C. QNET80 EQUIVALENCY OF DATA SETS & SUMMARY OF DATA SETS	33
C.1 CTPS.QNET80.LINKS and COORDINATES	33
C.2 CTPS.QNET80.LINES	34
C.3 Summary of QNET80 Dataset and Equivalency	34
C.3.1 CTPS.QNET80.MODEN.LISTED.RENODEX	52
C.3.2 CTPS.QNET80.MODEN.LISTED.LINES	63
D. SUMMARY OF TRANSIT NETWORK MAPS DEVELOPED AND USED	81
D.1 Massachusetts State Plane Coordinate Map Reference System	81
D.2 Summary of QNET80, TOWNNAME, CTPSNO and Map Location	83
E. SAMPLE QNET80 DECK SETUP TO RUN UNET/UPATH	93
F. ALLIED PROGRAMS DEVELOPED AND USED IN CONJUNCTION WITH THE NETWORK DEVELOPMENT	107

LIST OF FIGURES AND TABLES

FIGURES

2-1	Eastern Massachusetts Region, with Metropolitan Area Planning Council District	4
4-1	Commuter Rail Lines, with CTPS Node Numbers	12
4-2	MBTA Rail Rapid Transit Lines, with CTPS Node Numbers	14
4-3	Suggested Bus Speed as a Function of Highway Speed	17
B-1	Coordinate Data Card	30
B-2	Transit-Link Data Card	31
B-3	Transit-Link Data Card	32
D-1	Massachusetts State Plane Coordinate System	82
D-2	Transit Inventory Maps A-N: Areas Covered	84
D-3	Link Nomenclature on Transit Inventory Maps	85
D-4	Node Nomenclature on Transit Inventory Maps	86
E-1	CTPS.QNET80.UNET/UPATH Example Setup Flow Chart	94

TABLES

C-1	CTPS.QNET80.LINES.LISTED	35
C-2-1	CTPS.QNET80.SUMMARY.MODE1.LISTED.RENOD80	53
C-2-2	CTPS.QNET80.SUMMARY.MODE2.LISTED.RENOD80	54
C-2-3	CTPS.QNET80.SUMMARY.MODE3.LISTED.RENOD80	56
C-2-4	CTPS.QNET80.SUMMARY.MODE4.LISTED.RENOD80	57
C-2-5	CTPS.QNET80.SUMMARY.MODE5.LISTED.RENOD80	58
C-2-6	CTPS.QNET80.SUMMARY.MODE6.LISTED.RENOD80	59

C-2-7	CTPS.QNET80.SUMMARY.MODE7.LISTED.RENOD80	60
C-2-8	CTPS.QNET80.SUMMARY.MODE8.LISTED.RENOD80	61
C-3-1	CTPS.QNET80.TABLE.SUMMARY.MODE4	64
C-3-2	CTPS.QNET80.TABLE.SUMMARY.MODE5	65
C-3-3	CTPS.QNET80.TABLE.SUMMARY.MODE6	66
C-3-4	CTPS.QNET80.TABLE.SUMMARY.MODE7 (CTPS Number Sorted)	69
C-3-5	CTPS.QNET80.TABLE.SUMMARY.MODE7 (MBTA Number Sorted)	74
C-3-6	CTPS.QNET80.TABLE.SUMMARY.MODE8	79
D-1	Town or District and Transit Inventory Map by CTPS Zone Number	87
D-2	CTPS Zone Number and Transit Inventory Map by Town or District	89
D-3	Town or District and CTPS Zone Number by Transit Inventory Map	91
E-1-1	CTPS.QNET80.FILES Example Setup	95
E-1-2	CTPS.QNET80.UPNET Example Setup	97
E-1-3	CTPS.QNET80.UNET Example Setup	99
E-1-4	CTPS.QNET80.UPATH Example Setup	103

ACKNOWLEDGMENTS

During the development of this transit inventory data set program, many persons were involved over a period of years. Since the beginning of the network development, CTPS staff members have contributed during either directly, working on the networks, or indirectly, through the operation of the highway networks or consulting on railroad and commuter rail questions or on other details required of data for a network inventory. Other persons involved included numerous Northeastern University Coop students who, during their period at CTPS, coded networks, punched data cards, and helped in numerous other details relating to network development. To acknowledge each individual without omitting anyone who played a part would be virtually impossible. Therefore, acknowledgment must be made simply--and gratefully--to all who had any part in the inventory development during these many years.

Thanks are also due to the Massachusetts Bay Transportation Authority, the Massachusetts Department of Public Utilities, and the private bus and rail companies that provided data. All of these organizations rendered invaluable assistance.



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SUMMARY

An inventory of the transit services operating on a scheduled basis within the Eastern Massachusetts region has been developed as a computer-processible transit network. This comprehensive inventory includes five transit modes: commuter rail, Massachusetts Bay Transportation Authority (MBTA) rail rapid transit, MBTA local bus and trackless trolley, private local bus, and express bus. The network also includes a walk link, an auto-penalty link, and an auto-access link. The inventory is compatible with the Urban Transportation Planning System (UTPS) program package of the U. S. Department of Transportation's Urban Mass Transportation Administration and Federal Highway Administration.

This manual presents detailed descriptions of the inventory of transit services, the basic traffic-zone structure for Eastern Massachusetts, the highway network structure, and other required data. The procedure for putting these base data into the machine-processible format is discussed in detail. Correspondence tables relating the computer-processible data to the transit services--e.g., node numbers to station names--are provided. Typical examples of network analysis are discussed. The coding forms used to develop the computer-processible data are shown in the appendix, along with other computer programs developed to aid in the processing of the raw data into the desired format. The nature of the transit inventory and the philosophy behind the network model are discussed as the details are presented. This transit network, as a computer-processible transit data set for the Eastern Massachusetts region, is a viable basic tool already being used in numerous studies. Certain improvements to this tool are called for and should be developed in the process of using it.

1.0 INTRODUCTION

The development of a transit network suitable for use in planning studies requires a translation of route equipment and other physical quantities into abstract representations such as nodes and links. In this transformation, a number of assumptions must be made which may be simplifications but nonetheless are required if a reasonable network is to be formulated.

The transit network can be looked at as an engineering system which requires an estimate of loads it will be required to carry. These loads are determined by social and economic forces and are generally difficult to estimate. However, the network model should be developed in such a way that responses of the transit system to such loads can be predicted. In other words, the network model should be able to function as a simulation model.

The socio-economic input might be termed the driving "function" for the network. These data usually relate how the population is distributed, the number of cars per household, percentage of land used, etc.--a vast number of variables are possible to describe the specific region under study. How does one reduce the multitude of "variables of description" to a number of quantities which can characterize the region or the traffic zone? This must be done so as to provide an appropriate algorithm to be used in specific studies.

The transit-network model serves as a basic tool for calculation of travel volumes, traffic patterns, and other transportation information. The ground-level simulation tool is the network, whether it is used as the full-blown, detailed network, or is reduced to a local representation, or is used in some other very specific way. It is important that the base simulation network process be factored into any study in order to understand how the various results are affected by how the input data are treated.

Few established guidelines are available to be followed in developing an abstract network model adapted to the computer. Many of the notes and suggestions provided in this manual may apply only to the particular techniques that were developed, sometimes intuitively, to meet the specific requirements of creating the Eastern Massachusetts Region Transit Network. A number of selected references are given in Appendix A. The literature on transit networks is quite varied but, although much work has been carried out, there remain many unanswered questions.

Dial, for example, in reference (8), states that very little effort has gone into research and development of network models for transportation planning. UMTA reference (4) is an introduction to travel forecasting for transportation planners and analysts using the UTPS program package. Although various aspects of modeling are considered in this text, there appears to be very little in the way of a rational procedure for developing the transit model for simulation purposes.

This paper attempts to break some new ground in presenting a procedure to be considered for the coding of the transit systems in a specified region or area. Much of the work is based upon an intuitive approach and upon observation. Much more work must still be carried out in order for a computer-processible transit network procedure to be perfected. Analysis will be required to determine how the new procedures can be effectively applied.

In Chapter 2, some background on our transit-network development is given. Chapter 3 presents the data requirements for operating the basic UTPS programs UNET and UPATH. The transit services in the inventory are discussed in Chapter 4, including the various data sources used, and mapping needs are considered. Chapter 5 is the user's guide to the transit network computer-processible transit inventory discussed in the previous four chapters. Methods that may be used to operate the basic UTPS programs of UNET and UPATH are explained.

Six appendices are provided. Appendix A lists basic references on transportation-related computer programs and selected general references on transportation, among others. Appendix B contains copies of the coding formats useful for developing the data sets needed for UNET. Appendix C summarizes the various data sets used in UNET and cross-references data sets, enabling one to locate links, nodes and line data whenever desired. In Appendix D, maps useful for the study of these networks, the base maps used for the networks and other useful maps are discussed. In Appendix E, sample deck setups that can be used to operate UNET/UPATH programs are presented. Appendix F deals with allied programs developed and used in conjunction with transit-network development.

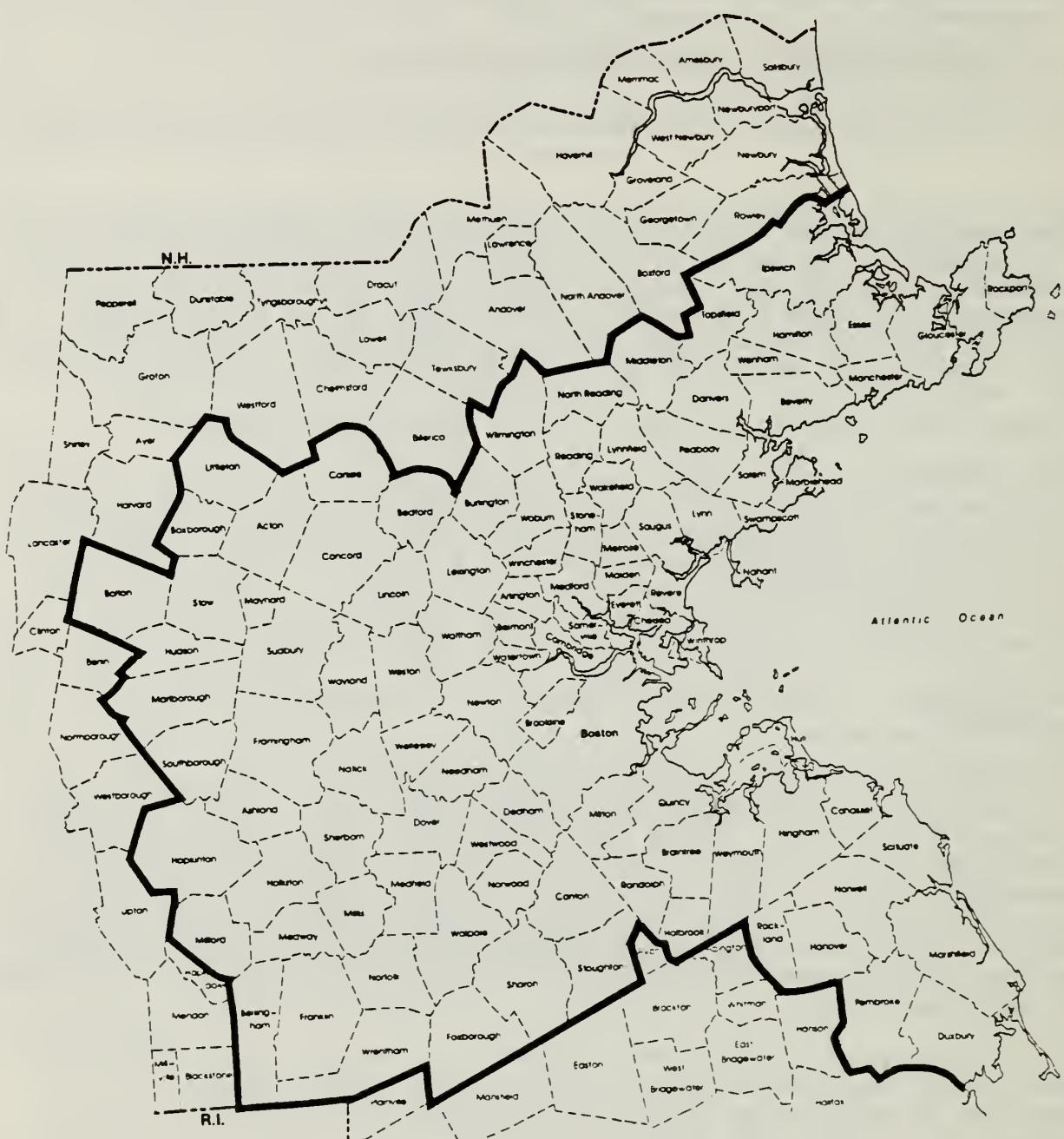
2.0 TRANSIT NETWORK DEVELOPMENT BACKGROUND

The transit network model was developed based upon a comprehensive inventory of the transit service within the Eastern Massachusetts region. Commuter rail, rail rapid transit, MBTA buses and non-MBTA bus service which operates on a scheduled basis in the 152 cities and towns in the region are included. The 152 communities in the Eastern Massachusetts region include 101 communities within the Metropolitan Area Planning Council (MAPC) area plus 51 outside the MAPC area. See Figure 2-1.

The transit network consists of a basic 1976-1977 transit network plus certain transit facilities committed for the base-year 1980 at the time of data collection. The route descriptions along with the assigned nodes are shown on a series of maps and tables of equivalent transit lines (on file at CTPS). Other pertinent data, such as the required distances, speed or time on a link for three possible time periods for each pair of nodes, and line information (including assigned line number, appropriate headway, and sequence of nodes which make up the line definition) are also presented.

The 1976-1977 transit network was developed as a joint coding effort with Alan M. Voorhees & Associates (AMV)--see reference (19)--and, modified with a 1975 update as well as certain 1980 committed transit facilities, was used as the simulation transit model for over a year. When more changes needed to be added to the base network, a critical review of the network model was made and it was decided that a completely new transit network should be developed based upon the experience gained from the use of the original network.

Considerable effort has been expended to develop a transit network which would accurately reflect the transit system of the Eastern Massachusetts region and operate computationally in an effective manner, and which could be used as the basic transit-simulation model for the region for some time to come with only minor modifications and updates as needed. All link speeds or times and headways for the various modes were carefully checked with current schedules at the time of data collection. Highway speeds were obtained from highway skim times to be used for the bus speeds on the particular segments of roadway on which they operate. Thus, much effort went into each phase of the coding. Details of each mode represented are discussed later on in this document.



— MAPC REGION BOUNDARY —



4 2 0 4 8 12
Scale in Miles

Technical Report 49
April 1985

EASTERN MASSACHUSETTS REGION

WITH

METROPOLITAN AREA PLANNING COUNCIL
DISTRICT

CTPS

FIGURE
2-1

The transit characteristics for the computer network are developed in the Urban Transportation Planning System (UTPS) format. The data input is in the form of link, line, and coordinate data. The specific transit-network program, UNET, creates and modifies a computerized description of a transit network for use as input in other programs within the UTPS family of computer programs.

3.0 UTPS PROGRAM UNET: DATA REQUIREMENTS

This chapter contains the data requirements for operating the unit program UNET.

The 1980 transit-network model describes the transit network, including commuter rail, rail rapid transit, and bus routes. The procedure carried out to reduce the data describing the various routes, time tables and equipment used is set down here. The assumptions used to describe or develop the required data sets and the actual inventory data set developed are discussed.

Link data describe the physical networks relative to the fixed base maps being used, and line data describe the transit routes in terms of the sequence of nodes. Each link in the network has the following information:

- 1) two node numbers to identify the link (these describe the ends of a specific line segment)
- 2) a mode or modes classification, numbered 1 through 8 (up to 5 modes may be used on a particular link)
- 3) a time or speed of operation over link by period
- 4) a distance along the link
- 5) whether the link is one-way or two-way

The route description of each network line will have the following information:

- 1) a mode classification
- 2) an assigned line (route) number
- 3) headway (frequency) data
- 4) a sequence of links describing the route

The sources of travel demand are defined by the CTPS 592 zone structure for Eastern Massachusetts. The transit routes operated are defined as LINES, the type of transport operations as MODES, the facilities over which the system operates as LINKS, and intersections of LINKS as NODES. The location of NODES can be made using a base-map system where the local latitude axis can be

used as the X-axis and longitudes are considered to be perpendicular to and along the X-axis. This orthogonal network will approximate the latitude and longitude coordinate systems quite accurately and is of sufficient accuracy for this study. See Appendix D for further details on the Massachusetts State Plane Coordinate Map system.

ZONING SYSTEM. The zoning system is defined in terms of the 592 CTPS zones, which are equivalent to the 1970 census tracts with the exception of zones 116 and 117, which straddle the dividing lines between tracts 815 and 817 and tracts 817 and 819, respectively. The zones cover an area extending north to the New Hampshire border, south to the vicinity of Plymouth, and west nearly to Worcester. Outside of the area adjacent to or within Route 128, the zones are almost always one zone to a community, even in dense areas such as Lawrence, Haverhill, Lowell, and Brockton. The center of activity for each zone is represented by a point termed the centroid. An indication of the distribution of the CTPS zones is given below:

<u>Area within Eastern Massachusetts</u>	<u>CTPS Zone Numbers</u>
Downtown Boston	1-60
Core Area	61-192
Logan Airport	193
Chelsea	194-199
Cambridge	200-229
Somerville	230-244
Brookline	245-256
Outside Core Adjacent to Route 128	257-479
Outside Route 128 within MAPC	480-541
Outside of MAPC within Eastern Massachusetts	542-592

LINES. The transit line describes a route and its level of service with mode designation, line number, headway, and sequence of transfer points. MODES. Eight modes are available for the UTPS user. Modes 1, 2, and 3, classified as non-transit, are used as the walk link, auto penalty, and the auto-access link, respectively. Modes 4 through 8 are designated as flexible public transport, and in the 1980 transit network program are designated as follows:

<u>Mode</u>	<u>Transit Service</u>
4	Commuter Rail
5	Rail Rapid Transit
6	Non-MBTA Bus
7	MBTA Bus & Trackless Trolley
8	MBTA & Private Express Bus

LINKS. The link defines the path of a particular transit line between two nodes, which link is given by the nodes at each end of the link, the distance between the nodes, the mode or modes which operate over this particular link segment, and the time required to traverse the link for the specified route. Hence, for a transit link, the nodes can be points of accessibility or transfer for the specific line. In a similiar manner the non-transit links allow access to the transit network from zone centroids by the use of the walk link, MODE = 1. This method allows the coding of access to the transit systems in the dense service areas where the numerous centroids could be connected to several transit modes. The centroid connectors to the transit system represent a step in the direction of actual representation of how riders reach their destination or how they leave their origin in the CBD to reach some transit mode. Travel times on walk links are assigned based upon a speed of three m.p.h. (264 ft./min.) up to distance of 2,750 feet (an approximately 10-minute walking transfer between modes). The auto connector links represent access by private vehicle to the public transport system. These links are often required in the outer towns of the Eastern Massachusetts region, where the transit mode is either commuter rail or bus (private carrier or MBTA). An auto penalty, MODE=2, can be used for a park-ride or kiss-ride condition, simulating penalty times, unusual transfer conditions, and other purposes required for simulation.

Earlier versions of UNET allowed the use of multiple links whenever one link exceeded one or more limit conditions imposed by UNET. The three key words in the &PARAM are as follows:

MAXTIME - maximum coded link time in minutes (25.5 minutes)

MAXDST - maximum link distance in miles (25.5 miles)

MAXSPD - maximum link speed in miles per hour (maximum coded is 255 m.p.h. and the default value is 60 m.p.h. as used in this report)

The above limit conditions occur in some of the AUTO CONNECTORS (MODE=3), which connect to the AUTO PENALTY (MODE=2), through to the CENTROID. The other end of the AUTO CONNECTOR is usually

terminated at a TRANSIT STATION (MODE=5), TRAIN STATION (MODE=4), or to a bus stop along the roadway (MODE=7 or 8). Since actual speeds on the highway are usually much lower than the 60-m.p.h. limit, especially during the peak hours, the maximum distance or time to be specified on the link must be much less than either MAXTIME or MAXDST. The relationship can be shown by the equation: TIME(MINUTES) = 60 ((DISTANCE IN MILES)/(SPEED IN M.P.H.))

Both the speed over a highway link and the distance between any two points are fixed. The time must be checked so as to not exceed the limit allowed. For long distances, this limit is usually exceeded and the link must be split into two or more links in order to meet the UNET maximum specified. Later versions of the UTPS program UPATH have a NONTRANSIT LINK AGGREGATION feature which combines these near-maximum time or distance links into a single link which usually exceeds the specified maximum. The message given is as follows:

PAT72300 (INFORMATION): While reading and storing the network, links were found with an impedance greater than the maximum (819). REPORT2 will be flagged with an *.
(NOTE: In QNET80, REPORT2 is on the order of 150 pages of computer printout.)

The question arises of how the walk time for a particular zone should be determined in order to account for the total population to be handed onto the transit system. Most transit riders come from a rather narrow strip segment of the population surrounding the transit line or lines. However, this walk time does not represent the total zone walk time to the transit system. A suggested method is to use the walk time from the centroid in order to represent the walk times for all the population rather than to use a maximum walk time of those who cluster near the transit lines. Different methods for determining walk times may be developed as use of the transit networks progresses.

NODES. The nodes represent the two ends of a link. Nodes are points in the transit network where transfers can be made from one line or mode to another line or mode. However, not all intersections, transit stops, and stations need be nodes in the simulation system.

4.0 DESCRIPTION OF THE TRANSIT SERVICES CODED

4.1 COMMUTER RAIL (MODE 4)

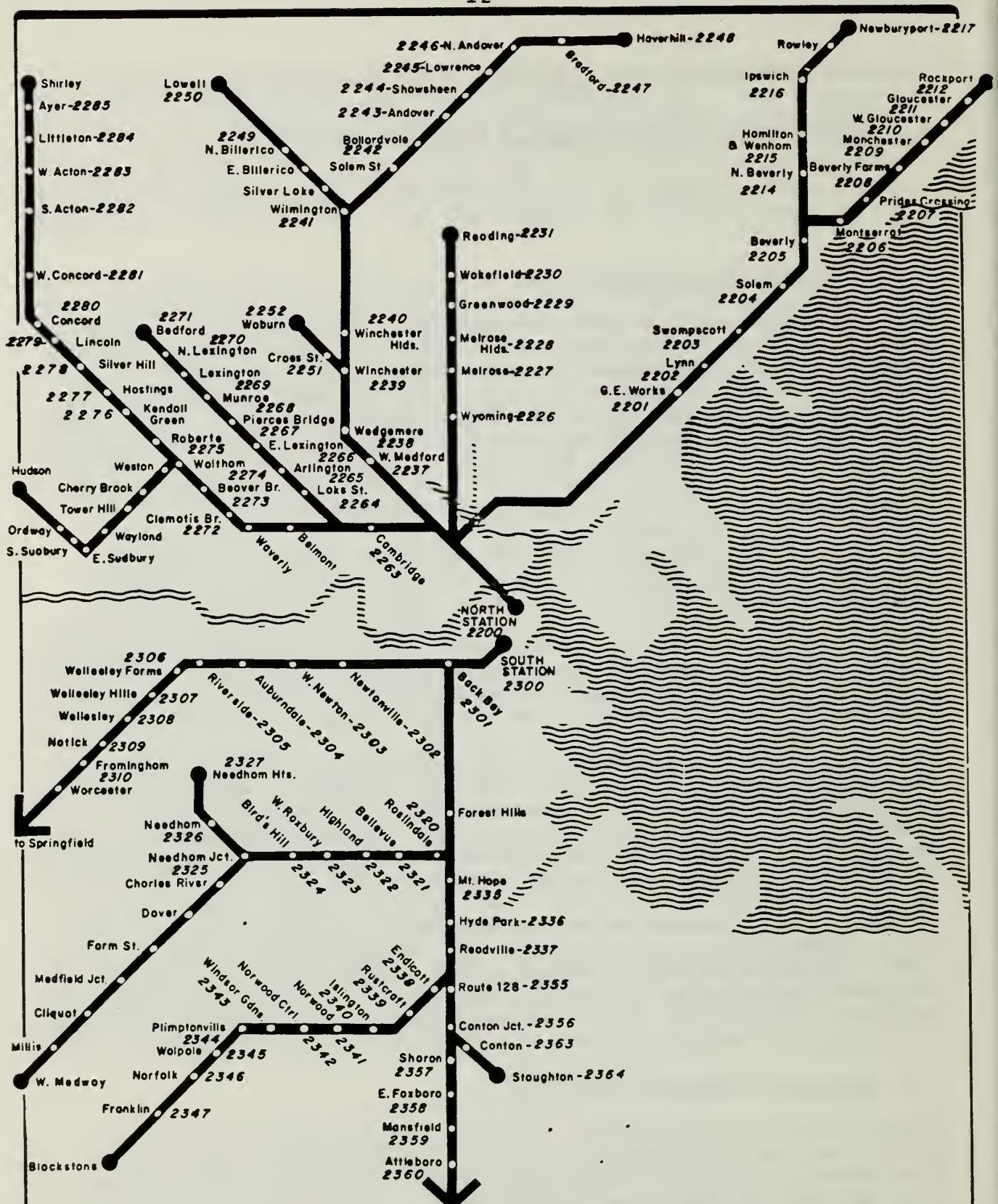
As it stands now, the coding of commuter rail services is based upon timetables dating back as far as 1976. This coding will be updated, as much has changed since then. In its present state the network reflects operations by Penn Central from South Station to points south and southwest of Boston and by the Boston and Maine Corporation (B&M) from North Station to points north and northwest of Boston. All commuter rail operations are listed as Mode 4. In Appendix section C.3.2, CTPS.QNET80.MODEN.LISTED.LINES, there are 21 lines listed for commuter rail.

The Penn Central service includes 16 lines along 5 different branches starting at South Station, with termini at Framingham, Needham, Needham Heights, Franklin, Providence, and Stoughton. Although Providence is not included within the boundaries of the inventory, it is used to indicate the route over which the particular line operates as far as Attleboro. Additional service also includes Canton Junction and Readville Junction as termini. Only the Norwood-to-Boston line is coded as two-way line.

The B&M service represented in the inventory consists of 21 lines from North Station to Rockport, Ipswich, Reading, Lowell, Woburn, West Medford, Winchester, Beaverbrook and Clementis Brook, Haverhill, and South Acton. Of the 21 lines represented, 13 are one-way lines along the 7 different branches either into Boston for the AM peak runs or out of Boston during the PM peak, as well as an express train from Woburn to Boston. Eight lines have a two-way line representation between Boston and the various termini. Figure 4-1 shows the commuter rail system and the CTPS node numbers assigned to the stations. There are two nodes assigned to Back Bay Station, 2301 and 2311, which represent the outbound and inbound nodes, respectively. Two nodes are assigned to prevent unloading or loading during inbound and outbound runs.

4.2 RAIL RAPID TRANSIT (MODE 5)

Mode 5 is used to represent the rail rapid transit portion of Massachusetts Bay Transportation Authority (MBTA) operations. This mode includes the following lines. The Red Line operates from Harvard to Braintree and Mattapan. The Braintree Branch was a committed line in the late 1970s and has been included in the 1980 transit network. The Blue Line goes from Bowdoin to Wonderland. The Orange Line runs from Forest Hills to Oak Grove



and the Green Line from Lechmere to Riverside, Boston College, Cleveland Circle, and Arborway. The lines are shown schematically in Figure 4-2, with node numbers assigned to each station. Some station numbers have been assigned to stations no longer used today.

There are 9 CTPS lines listed under Mode 5 in Appendix section C.3.2; all lines are operated as two-way lines.

4.3 NON-MBTA LOCAL BUS (MODE 6)

This inventory includes all of the scheduled bus routes operating into and around the Eastern Massachusetts region. We have made sure of including all possible routes by cross-checking numerous sources of data. Field trips were made whenever advisable. This mode required a considerable data-collection effort to determine fully the routes used and schedules of operations, and considerable analysis, because the route data were obtained in various formats. The routes were developed from company time tables which listed stops and frequency of operation. Difficulties in determining the routes or other information needed were resolved by telephoning the company.

Along with company data, CTPS was able to obtain from the Department of Public Utilities, through a request by the Massachusetts Bay Transportation Authority, information relating to individual route certificates as filed by certain of the scheduled common carriers. These certificates provided much of the information required. A fairly complete set of 1977 certificate information on nearly all the pertinent carriers in the Eastern Massachusetts region was obtained and is on file. The DPU also provided CTPS with an inventory of all carriers certified by the DPU at that time. This listed several hundred carriers, including school bus operators, charter companies, and other non-carriers. All the names were screened, a final list was determined, and each carrier was checked as to whether or not it operated on a scheduled basis.

The private bus carrier inventory includes 20 local bus companies operating routes represented by 115 different CTPS lines in Mode 6. See Appendix section C.3.2. Other non-MBTA buses are found in Mode 8, the express bus inventory.

4.4 MBTA LOCAL BUSES AND TRACKLESS TROLLEYS (MODE 7)

MBTA local bus and trackless trolley operations are the largest mode in the inventory. A considerable amount of data is available for these routes, much of it on the standard MBTA map of the region, which depicts routes and includes a chart showing the trip times and frequencies for rush hour, day, night, Saturday, and Sunday operation. (See Appendix A.4 for details about maps.) Other data included the MBTA's individual schedules



of operation and the timetable cards it issues that list schedules and provide a route map of each route or routes.

All these MBTA references were used to obtain the necessary data for the LINK and LINE cards. Routes which closed to form a loop circuit were divided into two one-way routes to comply with the UNET rules. In some instances a local MBTA bus route was categorized as express; for example, if it started from the suburb as a local and then proceeded to the CBD as an express. These lines are listed in Mode 8.

In Appendix section C.3.2, all the routes for Mode 7 included in this inventory are listed. The first set in the listing is in CTPS number sort, in column 2-4, while the second set is sorted on MBTA route number in column 63-69 and includes a number of other identifications, as necessary. Thus, these two sets may be used to determine the relationship between CTPS line number and MBTA route number.

All MBTA routes that had more than one or two scheduled runs in any period were included in this inventory. There are 227 lines listed under Mode 7; they represent 182 MBTA bus routes, some operated as one-way routes and some as two-way. Additional route information may be found on the CTPS transit inventory maps.

4.5 EXPRESS BUSES, MBTA AND PRIVATE (MODE 8)

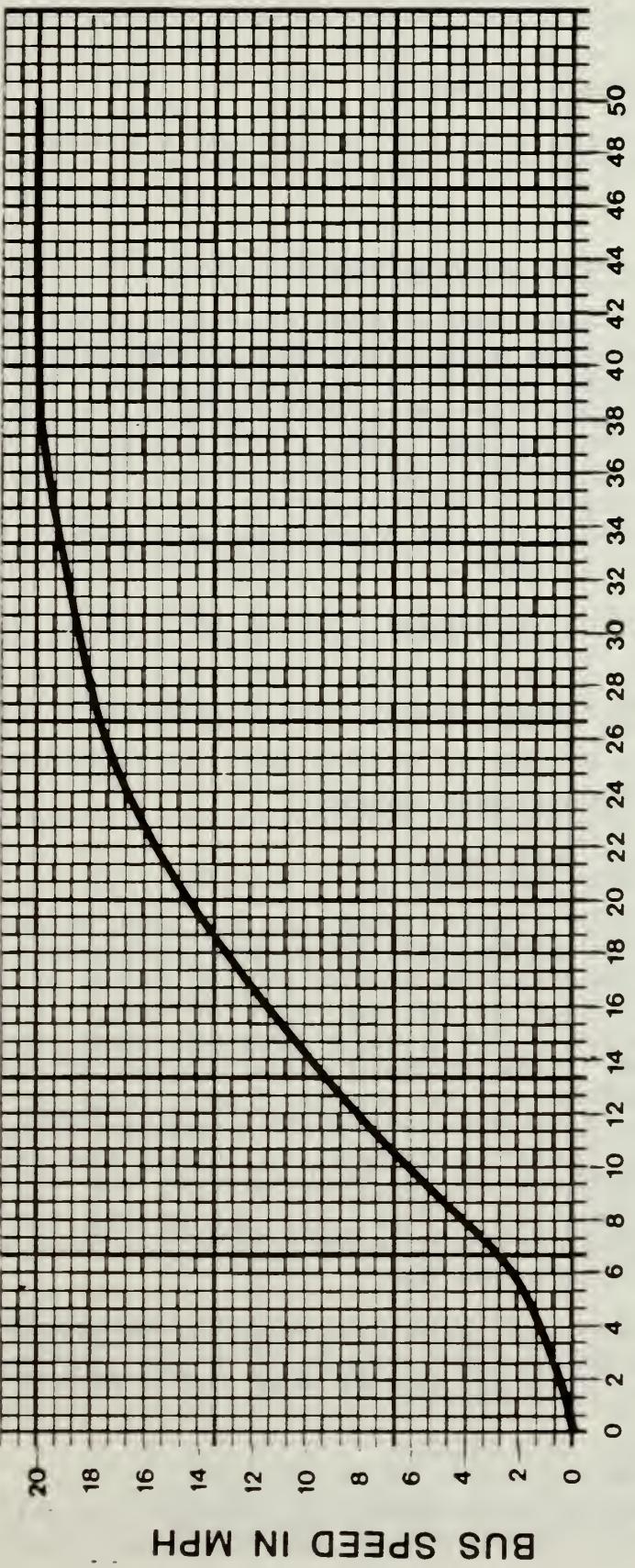
All express buses which operate into and out of the Boston CBD are grouped together as Mode 8 transit lines. These buses may operate as a local in the suburb but, as they approach the CBD, assume the character of an express bus into CBD. Some of the buses make more than one stop within the CBD, usually to discharge passengers to the transit lines or to take on passengers as outgoing buses to the suburbs. No local passengers are carried within the CBD area or in the suburbs where these buses operate.

The present system of MBTA and private buses operates such that, in the MBTA area, only MBTA buses operate as local buses. Thus all private buses operating into the CBD are express from about the Route 128 area to the CBD (the Essex Street terminal near South Station, the Greyhound terminal, the Park Square Trailways terminal, or the Haymarket terminal). (One bus, run by Ritchie Bus Company, operates to the vicinity of Park Square, but does not use any terminal.)

A complete list of all lines coded as express bus is given in Appendix C, section C.3.2. Of the 81 lines listed, there are 10 listed as two-way, whereas 71 are treated as one-way due to the routing or since they may only operate once in a particular time period. MBTA buses account for 23 lines, while 68 lines are private bus operations.

4.6 BUS SPEED DETERMINATION

The CTPS highway network was used to determine the various bus speeds on particular links. A description of the highway network may be found in reference (18). The procedure used was a special program that compares input node sequences with specified node sequences from the highway network. The speed determined from the highway network was then factored according to the relationship given by UTPS between highway auto speed and bus speed, shown in Figure 4-3. The speed or time determined in this manner provided the input for the bus links.



User's Guide to
CTPS Transit Network
Technical Report 49
April 1985

SUGGESTED BUS SPEED AS A FUNCTION OF HIGHWAY SPEED

CTPS

FIGURE
4-3

5.0 USER'S GUIDE TO TRANSIT NETWORKS

5.1 OUTLINE OF USER'S GUIDE INFORMATION

The previous sections of this report detailed the basic inventory of scheduled transit services within the Eastern Massachusetts region and discussed the various data sets developed. In this section, the methods that may be employed to produce the card data set of COORDINATES, LINKS and LINES are discussed. The appendices present further details of the data sets and note other related data necessary to understanding and using the transit inventory. The contents of the appendices are summarized in the introduction to this report.

Among the references listed in Appendix A, of particular importance are:

- (1) UTPS REFERENCE MANUAL, specifically program units UNET and UPATH
- (2) UTPS NETWORK DEVELOPMENT MANUAL

5.2 COPYING AND CREATING DATA SETS

IEBGENER is the IBM Utility Program that can be used to copy sequential data sets. It can be used to create individual data sets on either disk or tape from a source set of cards or to copy data sets from a disk or tape to another disk or tape. A typical set-up is shown in Appendix E for a card data set used to create a new data set on a disk. This example shows how an original base data set such as QNET80 can be copied from a tape to, for example, a newly created data set on a disk. Another example of IEBGENER use can also be found in Appendix E, under the step called STEPHEAD, which creates the heading section for the UNET program as a temporary data set. Thus, one can create one's own UNET data set from original cards or copy a data set from a library data source for one's own use.

The three typical data set-ups, with stepnames of STEPCOOR, STEPLINK, and STEPLINE, are shown in Appendix E and are used to create the data set from card input.

5.3 MODIFYING DATA SETS

A number of ways are available to modify or replace an existing data set. To replace a particular data set requires creating a

new replacement data set, as explained in Section 5.2. In most instances, only a few cards need be changed to create a modified data set. However, the QNET80 data sets number over 10,000 cards of links, lines, and coordinates and are not readily available in card output format. There are a number of methods available to change/replace a portion of the data set without re-creating the entire data set. These methods will be discussed in the following sections.

5.3.1 UNET Editing Process

The UNET program has an update feature in the LINK card in Column 12, where an update code of blank = add the link, and non-blank = delete the link. A similar column exists in the LINE card in Column 9, the DIRECTIONCODE, usually coded as 1 = one-way, 2 = two-way, and 0 = delete line. There is no procedure available in UNET to change a COORDINATE card in similar manner as for a LINK card.

5.3.2 UPNET Program Editing Process

There are some CTPS programs available which may be used to modify these data sets. One such program is UPNET, which may be used to modify coordinate cards as well. The UPNET format is much like the UNET format, and is as follows:

COORDINATE EDITING OPTION IN COLUMN 9

BLANK - ADD COORDINATE TO DATA SET

R - REPLACE COORDINATE AND OLD DATA SET WITH THIS ONE

D - DELETE COORDINATE FROM DATA SET (COLUMNS 1-9 NEED ONLY BE CODED, THUS "4" AND NODE NUMBER ARE NEEDED)

LINK EDITING OPTION IN COLUMN 12

BLANK - ADD LINK AB TO NETWORK

R - REPLACE LINK AB IN OLD NETWORK WITH THIS ONE

D - DELETE LINK AB FROM NETWORK (COLUMNS 1-12 NEED TO BE CODED, "1", ANODE, BNODE, UPDATE CODE)

LINE EDITING OPTION IN COLUMN 9. LINE CONTINUATION CARDS SHOULD BE CODED AS FOR UNET, WITH THE EDITING OPTION IN COLUMN 9 THE SAME ON ALL CARDS.

O (Digit Zero) - DELETE THE LINE FROM OLD NETWORK (ONLY ONE CARD, WITH COLUMNS 1, 4-7, 9 CODED, IS NEEDED TO DELETE A LINE, EVEN IF THAT LINE IS CODED ON SEVERAL CARDS IN THE OLD NETWORK)

1 - ADD THIS ONE-WAY LINE TO NETWORK

- 2 - ADD THIS TWO-WAY LINE TO NETWORK
- 3 - REPLACE OLD LINE OF THIS MODE AND NUMBER WITH THIS ONE-WAY LINE
- 4 - REPLACE OLD LINE OF THIS MODE AND NUMBER WITH THIS TWO-WAY LINE

Other details may be found in the original write-up of UPNET.

5.3.3 Alternative Method of Editing Data Sets

The previous two methods shown can be used to edit existing data sets. If large numbers of edits are desired, it may be desirable to obtain card output and modify the card output to retain as an original data set. It is usually not necessary to reproduce the entire 10,000 card data set, as an output of only a few cards is needed to make a large number of card changes.

There is a method of systematically creating smaller data sets which was helpful during the creation of the original data set. In Appendix E, the program procedure outlined to concatenate a number of data sets to create one large data set is shown.

In a similar manner, a number of smaller data sets may be created and then concatenated to produce the COORDINATES, LINKS, and LINES data set, as long as the data sets are compatible with UNET requirements. The only data which must be in SORT are those in the LINES data set. This data set must be in MODE and LINE NUMBER SORT. All links and coordinates need not be in SORT sequence, although COORDINATES must precede LINKS and LINKS precede LINES.

Another valuable program is RECMNG, which is a program that reads EBCDIC records up to 250 bytes in length and allows the user to select certain records on the basis of key bytes which the coder selects. Up to four different bytes may be coded to select the desired records for any single run. In some cases, it is desirable to use RECMNG more than once on a specific data set to select or eliminate the desired records. For example, it is quite simple to separate the coordinate, link, and line records into separate data sets by using the RECMNG program first on BYTE1(1)='4' for selecting coordinates, and similarly setting BYTE1(1)='1' for links, and '2' and '3' for line records. Once these data sets are created, further selection of records is possible simply by rerunning the RECMNG program. Thus, selecting BYTE1(13)='1' will select all MODE=1 links from the links-only data set. Note that this could be done with one RECMNG run, but would require more CPU since a greater number of record comparisons would be processed.

Hence, RECMNG may be used to break down the links data set into smaller data sets such as MODE=1 links, MODE=2 links, etc. These data sets may generally consist of about 100 cards or so, and

could be punched out in card format for corrections and/or changes or printed out for study if one desires to do so. UNET or UPNET may also be used to edit the data set, as was discussed in sections 5.3.1 and 5.3.2, respectively.

5.4 USING THE UNET PROGRAM

Once the link and line data sets or files are created, the network may be tested using the UNET program unit. The coordinate data set is not required as long as the plot program is not called. Using the UNET program, certain errors in the links and lines can be ascertained and the proper corrections made. When an error-free UNET network has been obtained, further analysis of the network can be carried out, such as the use of program UPATH to determine minimum paths.

The first section of the set up example for the UNET/UPATH program shown in Appendix E contains a series of JCL cards for scratching an old data set prior to creating a new one in its place. This is a precautionary step to prevent inadvertently aborting the run. The heading section to UNET is given in STEPHEAD, which consists of two comment cards, and &PARAM, &OPTION, &SELECT, and &DATA cards, in that order. The &DATA heads the data set of coordinate cards (if required) and the link and line data sets. These three (or two) data sets, constitute the input required to run UNET under statement:

```
//UNET.FT005F001 DD DSN=&XNET,UNIT=FDISK,DISP=(OLD,PASS),  
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200)
```

After UNET has created the network, all previous information is now stored in the files FT01F001-FT01F005, and the original input data is no longer required. Whenever a test run indicates an error-free UNET run, the above files should be retained for use in UPATH. This requires that DISP=(NEW,PASS) be reset to DISP=(NEW,KEEP), and the program UNET must be rerun to create the permanent files.

5.5 USING THE UPATH PROGRAM

Once an error-free UNET run is obtained, further tests may be made using other options of the UNET program and other UTPS programs. One can proceed to the phase of determining the shortest interzonal transit paths. This is done using the UTPS program UPATH. The program set-up is shown in Appendix E after the UNET program set-up. This program starts with the scratching of old UPATH files which may have the same name as the new UPATH file to be created. It includes creating the PATH files on FT09F001, the LINKFILE on FT12F001, the ALOCFILE on FT13F001 and, for example, the FARES file on FT11F001. The input to UPATH is on files already created by UNET and reset for use on UPATH starting with FT01F001 for UNET LINES, FT02F001 for the FREQUENCY

TABLES, FT03F001 for UNET LINKS, and FT04F001 for the ANODE TABLE. These details and other information may be found in the UTPS program write-up, reference (1).

Note that the sample set-up is again overriding the UPATH procedure and any override should include //UPATH.FT01F001 etc. for FT01F001 register, for example. Under the //UPATH.SYSIN etc., we see a similar set up as in UNET with the two comment cards and &PARAM, &OPTION, and &SELECT cards also included.

It should also be noted that in the statement for EXEC UPATH a TIME=1400 has been included. This setting prevents the UPATH program from stopping due to a time limit on developing interzonal paths. A typical run may take 2 to 3 hours of CPU to determine the 592 interzonal paths. It is further suggested that the final paths be put on tape for safekeeping and to release a large amount of space on the computer; something on the order of 335,000 bytes of space was required, in the case of QNET80.

APPENDICES

A. REFERENCES

A.1 UMTA AND FHWA REFERENCES

The following selected UMTA references are taken from the UMTA and FHWA report, Urban Transportation Planning System: Introduction, May 1976. For additional details and other references, see this document.

- 1) UTPS Reference Manual, April 2, 1979. Provides information on the function and use of the UTPS programs.
- 2) UTPS Network Development Manual (on UTPS tape). Covers transit network coding for use in UTPS programs.
- 3) Traffic Assignment, FHWA, August 1973. Available from FHWA, HHP-22, Washington, D.C. 20590. Covers aspects of traffic assignment and some network coding issues.
- 4) Introduction to Urban Travel Demand Forecasting, UMTA, March 1974. Summary, NTIS, PB 236-848/AS, \$9.25. A comprehensive instructional text on modern demand-modeling approaches, with case studies in application.
- 5) Guidelines for Trip Generation Analysis, FHWA, June 1967 (Reprinted April 1975.) Available from FHWA, HHP-209, Washington, D.C. 20590.
- 6) Calibrating and Testing a Gravity Model for Any Size Urban Area, FHWA, October 1965. (Reprinted March 1975.) Available from FHWA, HHP20, Washington, D.C. 20590.
- 7) Introduction to Urban Travel Demand Forecasting, UMTA, March 1974. Volume II--Evaluation, NTIS, PB 236-845/AS, \$4.75.

A.2 SELECTED GENERAL REFERENCES ON TRANSPORTATION

- 8) Behavioral Travel-Demand Models, Peter R. Stopher and Arnim H. Meyburg.
- 9) A Guide to Models in Governmental Planning and Operations, Office of Research and Development, Environmental Protection Agency, Washington, D.C. 20450, August 1974. Chapter 7, "Models in Transportation," by Kenneth W. Webb, Frank L. Spielberg and Peter S. Lorebal.

- 10) Fundamentals of Transportation System Analysis, Marvin L. Manheim, 1975 Edition.
- 11) Principles of Urban Transport System Planning, B. A. Hutchinson, Script a Book Company, Washington, D.C., 1974.
- 12) Passenger Transport Demand in Urban Areas, Methodology for Analyzing and Forecasting, A. Bonnafous, B. Gerardin. Report of the Thirty-Second Table on Transport Economics, held in Paris on December 4 and 5, 1975, European Conference of Ministers of Transport.
- 13) An Introduction to Urban Development Models and Guideline for Their use in Urban Transportation Planning, Will Terry Moore, Fredic J. Ridel, and Carlos A. Rodriguez, U. S. Department of Transportation, Federal Highway Administration, Office of Planning, Urban Planning Division, October 1975.
- 14) Transport Planning Models: The London Experience, B. V. Martin, Highway Research Record No. 309, Highway Research Board, Washington, D.C., 1970.
- 15) "Models in Urban Planning: A Synoptic Review of Recent Literature," A. G. Wilson, Urban Studies, Vol. 5, No. 3, pp. 249-276, 1968.
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- 17) Transportation and Traffic Engineering Handbook, Institute of Traffic Engineers, John E. Baerwald, Editor. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1976.
- 18) TASK I, 1963 Highway Network Development, Final Report, Michael R. Birdsall, Dennis L. Hinrichs, and Lawrence H. Tittemore, Peat, Marwick, Mitchell & Company, August 16, 1972 MDPW I.009 4608:4614 02 06 01 44.
- 19) AMV Preliminary Network Data, Transit Network Development--Technical Report, Job 603-110, M. Golenberg, June 20, 1975, Alan M. Voorhees & Associates, Inc.

A.3 SPECIAL REFERENCES

Comprehensive Traffic and Transportation Inventory, Wilbur Smith and Associates, 1965, for the Boston Regional Planning Project.

Coding Manual, (Dwelling-Unit Survey, External-Cordon Survey, Truck Survey, Taxi Survey), Wilbur Smith and Associates, 1964, for the Boston Regional Planning Project.

Street Coding Index, Wilbur Smith and Associates, 1964, for the Boston Regional Planning Project.

Traffic Zone Maps (with sub-zones), Boston Regional Planning Project, 1963 (65 maps).

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Census of Housing: 1970 (Block Statistics), Final Report, HC(3)-111, Fitchburg/Leominster, Mass. Urbanized Area, U. S. Bureau of the Census.

A.4 SPECIAL COMPUTER-RELATED REFERENCES

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IBM System/360 and System/370 Fortran IV Language, GC-28-6515-10 file no. S360/370-25.

IBM System/360 Operating System Fortran IV (G and H) Programmers's Guide, GC28-6817-4, file no. S360-25.

PL/I, Fortran Programming Texts and CTPS Software Programs:

PL/I Structured Programming, Joan K. Hughes, John Wiley & Sons, New York, 1979.

A Guide to PL/I, 2nd Edition, Seymour V. Pollack & Theodore D. Sterling, Holt, Rinehart and Winston, New York, 1976.

Programming Language/One, with Structural Programming, Frank Bates and Mary L. Douglas, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

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A.5 MAP REFERENCES

Official Transportation Map, issued by the Massachusetts Department of Public Works, 10 Park Plaza, Boston, Massachusetts 02116.

MBTA System Map, issued by the Massachusetts Bay Transportation Authority, 10 Park Plaza, Boston, Massachusetts 02116.

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United States Department of Interior, Geological Survey, Topographic Maps of Massachusetts, scale 1" = 2000 ft., Eastern Mapping Center, Topographic Division, U. S. Geological Survey, Reston, Virginia 22092 (for mapping in Massachusetts, Rhode Island and Connecticut).

B. CODING FORMS USED IN TRANSIT INVENTORY

The three main coding forms required for UNET are:

- (1) coordinate data card
- (2) transit link data card
- (3) transit line data card

The coordinate data card is shown in Figure B-1. A "4" in column 1 distinguishes the coordinate data card. The node number is in columns 3-6, the x-coordinate in columns 13-20, and the y-coordinate in columns 23-30. Only columns 1-30 are used for the UNET coordinate data card.

The transit link data card is shown in Figure B-2 as taken from the UMTA manual. A "1" in column 1 distinguishes the link card from all other cards used in UNET. For full details, the user is referred to the UMTA manual on UNET, where a full discussion of the input quantities is given. Since the card uses only columns 1-62, columns 63-80 have been used for additional MODE 1 QNET80 link data. These include special information of value to some studies. Details on these data are presented in section C.3.1.

The transit line data card is the UMTA format for the UTPS transit line data, and is presented in Figure B-3. Note that column 1 is left blank, since either "2" or "3" may be used in this column: if the card does not refer to a previous line, then a "2" is used; if the card has reference to a previous line, then a "3" must be used in column 1. A complete set of line cards is shown in Table C-1, which lists all lines as represented in QNET80.

COORDINATE DATA CARD	
PROGRAMMER	DATE
PUNCHING	GRAPHIC
INST.	PUNCH

NODE NUMBER	X-COORDINATE	Y-COORDINATE
1	2	3
2	3	4
3	4	5
4	5	6
5	6	7
6	7	8
7	8	9
8	9	10
9	10	11
10	11	12
11	12	13
12	13	14
13	14	15
14	15	16
15	16	17
16	17	18
17	18	19
18	19	20
19	20	21
20	21	22
21	22	23
22	23	24
23	24	25
24	25	26
25	26	27
26	27	28
27	28	29
28	29	30
29	30	31
30	31	32
31	32	33
32	33	34
33	34	35
34	35	36
35	36	37
36	37	38
37	38	39
38	39	40
39	40	41
40	41	42
41	42	43
42	43	44
43	44	45
44	45	46
45	46	47
46	47	48
47	48	49
48	49	50
49	50	51
50	51	52
51	52	53
52	53	54
53	54	55
54	55	56
55	56	57
56	57	58
57	58	59
58	59	60
59	60	61
60	61	62
61	62	63
62	63	64
63	64	65
64	65	66

CTPS Technical Report 49

COORDINATE DATA CARD

Figure B-1

UTPS
UMTA Transportation Planning System

PROJECT REQUEST
SEQUENCE

CONTENTS

PAGE OF

SEQUENCE

DATE

DALE

CTPS Technical Report 49

TRANSIT LINK DATA CARD

TRANSIT LINE DATA CARD

Figure B-3

C. QNET80 EQUIVALENCY OF DATA SETS AND SUMMARY OF DATA SETS

C.1 CTPS.QNET80.LINKS AND COORDINATES

The transit link data card format is shown in Figure B-2. The format for the link data card is as follows:

<u>Column</u>	<u>Description of Item in the Column</u>
1	Link Card = 1
2-6	ANODE
7-11	BNODE
12	Update Code
13-17	Modes on Link (1 through 5)
18-21	Distance in Tents of Miles
	ANODE TO BNODE DATA
22-24	A.M. Speed in Integer Miles per Hour or
25-27	A.M. Time in Tents of Minutes
28-30	P.M. Speed or
31-33	P.M. Time
34-36	Off Peak Speed or
37-39	Off Peak Time
40	Set to 2 if twoway, otherwise blank
	BNODE TO ANODE DATA WHEN DATA IS NOT TWO WAY
41-62	Same as columns 18-39
63-72	Identification
73-80	Columns not used for link data (may be used for Carrier Name/Route Number)

The link data set at the present time constitutes 11,820 records and is available on special tapes to be transferred to the disk or to another tape for a data set build. Similarly, there are 6,523 coordinate cards defining the coordinates of the nodes used in this particular version of QNET80. These data are also stored on a specific tape and may be transferred as the need arises. The coordinate cards are not necessary if plots are not requested. For sample card setups, see Appendix E.

C.2 CTPS.QNET80.LINES

A complete list of the line cards is presented in Table C-1. Refer to Appendix B, Figure B-3 for each column represented. Line cards must be sorted as to mode number (column 4) and line number (columns 5-7). Thus the line cards are listed as mode 4, 5, 6, 7, and 8, with increasing line numbers for each mode. Furthermore, the highest line number allowed is 255, although line numbers need not be consecutive. The headway is given in columns 10-24 for AM, PM, MID, NITE and MINIMUM periods. The route description as a sequence of node numbers is given in columns 25-69. Column 72 is used to place a T to designate the end of the line card sequence. There can be no omissions in the node number sequence as far as each card is concerned. Finally, the line identification is given in columns 73-80; an abbreviation format suitable for 8 characters is shown. Further descriptions of the line may be found in Table C-3, which lists the individual lines and gives other pertinent information. The data set as shown constitutes the LINES portion of the data set for QNET80.

C.3 SUMMARY OF QNET80 DATA SET AND EQUIVALENCY

The data set QNET80 contains at this listing 19,167 80-byte records as follows:

Coordinate Records	6,523
Link Records	11,820
MODE 1	2,050
MODE 2	3,330
MODE 3	4,247
MODE 4	98
MODE 5	95
MODE 6	507
MODE 7	1,140
MODE 8	353
Line Records	822
MODE 4	51
MODE 5	18
MODE 6	177
MODE 7	387
MODE 8	189
"Nine" Records	2
TOTAL RECORDS	19,167

TABLE C-1 CTPS.QNET80.LINES

2	24	111620380900	2200	2202	2203	2204	2205	2206	2207	2208	2209	BOS-ROCK
2	24	121	2210	2211	2212							TBOS-ROCK
2	24	211405810999	2212	2211	2210	2209	2208	2207	2206	2205	2204	ROCK-BOS
2	24	221	2203	2202	2200							TROCK-BOS
2	24	311800385900	2200	2202	2203	2204	2205	2214	2215	2216		TBOS-IPSW
2	24	411400600990	2216	2215	2214	2205	2204	2203	2202	2200		TIPSW-BOS
2	24	512200200600	2200	2226	2227	2228	2229	2230	2231			TBOS-READ
2	24	611600	2200	2239	2241	2249	2250					TBOS-LONE
2	24	711210	2200	2252								TBOS-WOBU
2	4	811 350637	2200	2238	2239	2241	2249	2250				TBOS-LONE
2	4	911600 912	2200	2238	2239	2251	2252					TBOS-WOBU
2	4	1011446600820	2250	2249	2241	2239	2238	2200				TLOWE-BOS
2	4	1111198340825	2252	2251	2239	2238	2200					TWOBU-BOS
2	4	1211 250	2200	2237	2238	2239	2251	2252				TBOS-WOBU
2	4	1311380	2237	2200								TWMED-BOS
2	4	1412999999	2200	2263	2264	2265	2266	2267	2268	2269	2270	BOS-BEDF
2	4	1422	2271									TBOS-BEDF
2	4	1512999999	2200	2239								TWINCH-BO
2	4	1612999460	2200	2263	2286	2287						TBOS-BEAV
2	4	1712999999	2200	2253	2245	2247	2248					TBOS-HAVE
2	4	1811470 800	2200	2263	2272	2273	2274	2275	2276	2279	2280	BOS-SO.A
2	4	1821	2281	2282								TBOS-SO.A
2	4	1911 300	2200	2263	2272	2273	2274	2275	2276	2277	2278	BOS-SO.A
2	4	1921	2279	2280	2281	2282						TBOS-SO.A
2	4	2011 650800	2282	2281	2280	2279	2276	2275	2274	2273	2272	SO.A-BOS
2	4	2021	2263	2200								TSO.A-BOS
2	4	2111300	2282	2281	2280	2279	2278	2277	2276	2275	2274	SO.A-BOS
2	4	2121	2273	2272	2263	2200						TSO.A-BOS
2	4	3011999999	2300	2301	2302	2303	2304	2305	2306	2307	2308	BOS-FRAM
2	4	3021	2309	2310								TBOS-FRAM
2	4	3111 600	2300	2301	2302	2303	2304	2306	2307	2308	2309	BOS-FRAM
2	4	3121	2310									TBOS-FRAM
2	4	3211600	2310	2309	2308	2307	2306	2304	2303	2302	2301	FRAM-BOS
2	4	3221	2300									TFRAM-BOS
2	4	3311600800900	2358	2357	2356	2355	2337	2336	2335	2301	2300	TPROV-BOS
2	4	3411400 999	2356	2355	2301	2300						TCANJUNCT
2	4	3511600 999	2337	2301	2300							TREADVILL
2	4	3611999350999	2300	2301	2335	2336	2337	2355	2356	2357	2358	TBOS-PROV
2	4	3711999600	2300	2301	2355	2356						TCANTJUNC
2	4	3811999600	2300	2301	2337							TREADVILL
2	4	3911260 850	2327	2326	2325	2324	2323	2322	2321	2320	2319	NEED-BOS
2	4	3921	2301	2300								TNEED-BOS
2	4	4011 250850	2300	2301	2319	2320	2321	2322	2323	2324	2325	BOS-NEED
2	4	4021	2326	2327								TBOS-NEED
2	4	4111600 999	2347	2346	2345	2344	2343	2342	2341	2340	2338	FRAM-BOS
2	4	412	2337	2301	2300							TFRAM-BOS

2 4 4212999999	2342 2341 2340 2338 2337 2301 2300	TNORW-BOS
2 4 4311 600999	2300 2301 2337 2338 2340 2341 2342 2343 2344	BOS-FRAM
2 4 4321	2345 2346 2347	TBOS-FRAM
2 4 4411400600	2364 2363 2356 2355 2301 2300	TSTON-BOS
2 4 4511600400	2300 2301 2355 2356 2363 2364	TBOS-STON
2 15 112 40 40 75	1800 1801 1802 1803 1804 1805 1806 1807 1809	BLUE LIN
2 15 122	1810 1811	TBLUE LIN
2 15 212 45 45 85	1839 1838 1837 1836 1835 1820 1821 1822 1823	ORANGE L
2 15 22	1824 1825 1826 1827 1828 1829 1830	TORANGEX
2 15 312 55 55 90	1863 1864 1865 1845 1846 1847 1848 1849 1850	RED ASHM
2 15 322	1851 1852 1853 1854 1855	TRED ASHM
2 15 412110110110	1877 1878 1879 1880 1881 1882 1883 1920 1921	RIVSIDE
2 15 422	1922 1923 1924 1925 1926 1927 1928 1929 1930	RIVSIDE
2 15 432	1931 1932 1933 1934	T RIVSIDE
2 15 512 70 90 80	1880 1881 1882 1883 1944 1945 1946 1947 1948	ARBOR
2 15 522	1949 1950 1951 1952 1953	T ARBOR
2 15 612 75 75 70	1875 1876 1877 1878 1879 1880 1881 1882 1883	CLEVCIR
2 15 622	1920 1921 1905 1906 1907 1908 1909 1910	T CLEVCIR
2 15 712 75 75 70	1875 1876 1877 1878 1879 1880 1881 1882 1883	BC&LECH
2 15 722	1920 1921 1890 1891 1892 1893 1894 1895	T BC&LECH
2 15 812 30 30 80	1862 1861 1860 1859 1858 1857 1856 1871	TMATT-ASH
2 15 1012 55 55 90	1870 1869 1868 1867 1866 1850 1849 1848 1847	REDEXSOB
2 15 1022	1846 1845 1865 1864 1863	TREDEXSOB
2 6 111800750999	6424 2488 6425 2604 6426 2605 2310 6427 6428	TBWT-IN
2 6 211999750999	6428 6427 2310 2605 6426 2604 6425 2488 6424	TBWT-OUT
2 6 312600600600	1862 2405 6459 6460 6461 2431 6462 2363 6231	TBHT-STOU
2 6 322	2364	TBHT-PKwy
2 6 411300300300	1862 2405 6459 6460 6464 6465 2686	TMCC-WAVE
2 6 512600600600	1862 2405 6459 6460 6461 2431 6462 2363 6231	RTI-HL-O
2 6 612600600600	6088 6466 6467 6468 2643 2273	RTI-HL-O
2 6 711170100250	1807 2591 6488 6489 6490 5714 6492 6493 6484	RTI-HL-I
2 6 721	6483 6482	RTI-HL-I
2 6 811120200250	6482 6483 6484 6493 6492 5714 6490 6489 6488	RTI-HL-I
2 6 821	2591 1807	TRTI-CT-0
2 6 911 80180250	6482 6483 6484 6485 6486 6487 6489 6488 2591	TRTI-CT-0
2 6 921	1807	TRTI-CT-0
2 6 1011130100250	1807 2591 6488 6489 6487 6486 6485 6484 6483	TRTI-CT-0
2 6 1021	6482	TRTI-CT-0
2 6 1111200180250	5714 6492 6493 6484 6483 6482	TRTI-PB-0
2 6 1211150200250	6482 6483 6484 6493 6492 5714	TRTI-PB-0
2 6 1311 999999	1855 6616 6615 6201 6624 2428 5389 5388 6606	HUDSON
2 6 1321	5384 6605 2425 6604 6600 6609 6499 2660 6498	ASHMONT-
2 6 1331	6596 6497 6496 2673 6495 6494	TWHITMAN
2 6 1411999 999	6494 6495 2673 6496 6497 6596 6498 2660 6499	HUDSON
2 6 1421	6609 6600 6604 2425 6605 5384 6606 5388 5389	HUDSON
2 6 1431	2428 6624 6201 6615 6616 1855	WHITMAN-
2 6 1511600999999	6603 6602 2662 2661 6601 6600 6617 6618 5892	TASHMONT
2 6 1521	5354 2423 6619 6620 6621 6622 5398 6630 5389	HUDSON
2 6 1531	2428 6624 6201 6615 6616 1855	ROCKLAND
2 6 1611999900999	1855 6616 6615 6201 6624 2428 5389 6630 5398	T-ASHMONT
		HUDSON

2	6	1621		6622	6621	6620	6619	2423	5354	5892	6618	6617	ASHMONT-
2	6	1631		6600	6609	6601	2661	2662	6602	6603			TROCKLAND
2	6	1711	999999	6609	6600	6617	6618	5892	5354	2423	6619	6620	HUDSON
2	6	1721		6621	6622	5398	6630	5389	2428	6624	6201	6615	SO.WEY-
2	6	1731		6616	1855								TASHMONT
2	6	1811999600999		1855	6616	6615	6201	6624	2428	5389	6630	5398	HUDSON
2	6	1821		6622	6621	6620	6619	2423	5354	5892	6618	6617	ASHMONT-
2	6	1831		6600	6609								TSO.WEY
2	6	1911600750600		6609	6600	6604	2425	6605	5384	6606	5388	5389	HUDSON
2	6	1921		2428	6624	6201	6615	6616	1855				TSWEY-ASH
2	6	2011400380600		1855	6616	6615	6201	6624	2428	5389	5388	6606	HUDSON
2	6	2021		5384	6605	2425	6604	6600	6609				TASH-SWEY
2	6	2111999		5342	7141	5350	5349	6627	5892	5354	2423	6619	HUDSON
2	6	2121		6620	6621	6622	5398	6630	5389	2428	6624	6201	HINGHAM-
2	6	2131		6615	6616	1855							TASHMONT
2	6	2211	999	1855	6616	6615	6201	6624	2428	5389	6630	5398	HUDSON
2	6	2221		6622	6621	6620	6619	2423	5354	5892	6627	5349	ASHMONT-
2	6	2231		5350	7141	5342							THINGHAM
2	6	2311999		5350	5349	6627	5892	5354	2423	6619	6620	6621	HUDSON
2	6	2321		6622	5398	6630	5389	2428	6624	6201	6615	6616	EAST.WEY
2	6	2331		1855									T-ASHMONT
2	6	2411	999	1855	6616	6615	6201	6624	2428	5389	6630	5398	HUDSON
2	6	2421		6622	6621	6620	6619	2423	5354	5892	6627	5349	ASHMONT-
2	6	2431		5350									TEAST.WEY
2	6	2512600600600		6749	6750	6757	6758	5528	6029	6759	2498	6760	HBL123
2	6	2522		5740	5878	6761	6762	6763	5744				THBL123
2	6	2612300300300		5744	5743	5739	6764	6760	2607				THBL 79
2	6	2712600750600		6770	6771	2338	6772	6773	6774	6775	6776	2409	HBL 34
2	6	2722		5458									THBL 34
2	6	2812600600999		2339	6766	2338	6767	6768	6769	2407	5868	6777	THBL 34
2	6	2912	600	2339	6766	2338	6767	6768	6769	6773	6774	6775	HBL 34
2	6	2922		6776	2409	5458							THBL 34
2	6	3011999750840		6826	6817	6816	6815	6814	6813	6812	6811	2212	ACTION 1
2	6	3021		6810	6809	6808	6807	6806					TACTION 1
2	6	3111999	999	6806	6807	6808	6809	6810	2212	6811	6812	6813	ACTION 2
2	6	3121		6814	6815	6816	6817	6826					TACTION 2
2	6	3212999750600		6826	6822	2210	6823						TACTION3A
2	6	3311999750600		6806	6825	6824	2210	6822	6826				TACTION3B
2	6	3412999	999	6806	6807	6808	6819	6820	6821				TACTION4A
2	6	3511999	999	6826	6817	6818	2211	6807	6806				TACTION4B
2	6	3611600500840		6433	6546	6561	6865	6866	6867	6868	6869	6870	TMCLO-LA
2	6	3621		6871	6872	6873	6845						TTMCLO-LA
2	6	3711600750840		6845	6873	6872	6871	6870	6869	6868	6867	6866	TMCLA-LO
2	6	3721		6865	6561	6546	6433						TTMCLA-LO
2	6	3811600750600		6874	6875	6876	6877	6845	6878	6844	6879	6880	TMC LAW4
2	6	3821		6881									TTMC LAW4
2	6	3911600750600		6881	6882	6879	6844	6878	6845	6877	6875	6874	TTMC LAW4
2	6	4011600750600		6883	6884	6885	2245	6845	6878	6886	6887	6888	TTMC LAW3
2	6	4111600750600		6888	6886	6878	6845	2245	6885	6889	6884	6883	TTMC LAW3
2	6	4211600750600		6845	6878	6844	6843	6895	6896	6897			TTMC LAW2

2	6	4311600750600	6897	6898	6927	6928	6843	6844	6878	6845	TTMC LAW2
2	6	4411600750600	7140	6869	6870	6871	6872	6873	6845	6878	TMC LAW1
2	6	4421	6892	6894							TTMC LAW1
2	6	4511600750600	6894	6892	6844	6878	6845	6873	6872	6871	TMC LAW1
2	6	4521	7140								TTMC LAW1
2	6	4612600750600	6899	6890	6840	6841	7130	6843	6844	6878	TMC LAW5
2	6	4622	2245	6846	6847	2243	6893				TTMC LAW5
2	6	4712600750600	6899	6890	6893	2243	6847	6846	2245	6845	TTMC LAW5
2	6	4812600750600	6900	6915	6916						TBOSC RED
2	6	4912600750600	6900	6915	6917	6918	6919				TBOSCBLUE
2	6	5011600750600	6900	6920	6921	6922					TBOSC GRE
2	6	5111600750600	6922	6920	6900						TBOSC GRE
2	6	5211600750600	6900	6923	6924	6925	6926				TBOSC YEL
2	6	5311600750600	6926	6924	6923	6900					TBOSC YEL
2	6	5411600750600	6900	2248	6901	6904	6905	6906	6907	6903	BOSC ORA
2	6	5421	6912	6913	6914						TBOSC ORA
2	6	5511600750600	6900	2248	6901	6903	6908	6909	6910	6911	6700
2	6	5521	6902	6912	6913	6914					TBOSC ORA
2	6	5611999999999	6433	6554	6555	2450	6434	2452	6435	2514	6417
2	6	5621	2508	2252	6415	2522	6438	2515	6437		VOCELL I
2	6	5711999999999	6437	6436	6417	2514	6435	2452	6434	2450	6555
2	6	5721	6554	6433							VOCELL O
2	6	5811600300900	5332	6401	5209	5210	1945	7155	1946	5659	1947
2	6	5821	5660	1924	5609	5696	5608	5601	2568	5496	5488
2	6	5831	2412	6432	2307	6431	6200	6430	6429	2606	6428
2	6	5841	6427	2310							WFB-OUT
2	6	5911300600900	2310	6427	6428	2606	6429	6430	6200	6431	2307
2	6	5921	6432	2412	5488	5496	2568	5601	5608	5696	5609
2	6	5931	1924	5660	1947	5659	1946	7155	1945	5210	5209
2	6	5941	6401	5332							TWFB-OUT
2	6	6012300300400	6505	6505	2657						WFB-IN
2	6	6112300300400	6505	6507	6508	6509	6510	6511			WFB-IN
2	6	6212300300400	6505	6507	6513	6516	6514	6512	6511		WFB-IN
2	6	6312300300400	6505	6507	6513	6516	6517				TBAT-1
2	6	6411300300400	6505	6518	6519	6521					TBAT-2
2	6	6511300300400	6521	6520	6519	6518	6505				TBAT-3
2	6	6612300300400	6505	6518	6522	6521					TBAT-4
2	6	6712300300400	6505	6523	6524	6526	2674				TBAT-4A
2	6	6812300300400	6505	6507	6508	6527	6528	6529			TBAT-5
2	6	6912300300400	6505	6523	6530	6533	5395				TBAT-6
2	6	7012300300400	6505	6507	6513	6536	6515	6509	6534	6535	TBAT-7
2	6	7112300300400	6505	6507	6513	6537	6538	6539	6540		TBAT-8
2	6	7212300300400	6505	6507	6508	6527	6524	6541	6542		TBAT-9
2	6	7312300300400	6505	6523	6530	6531	6532				TBAT-10
2	6	7412230220370	6505	6506	2657	6543	5393	2658	5507	6544	2429
2	6	7422	5381	2404	6545	1855					BAT-ASHM
2	6	7512400300600	6546	6547	6548	6549	6550	6551			TBAT-ASHM
2	6	7612270333500	6571	6553	6554	6555	2450				TLRT-702
2	6	7712480333560	6546	6547	6548	6552					TLRT-703
2	6	7812240300525	6546	7058	6557	6558	6559	2455	6560		TLRT-704
											TLRT-705

2	6	7911400	600	6546	6561	6562	6563	2696		TLRT706AM			
2	6	8011300	525	2696	6564	6561	6546			TLRT706AM			
2	6	8111	375600	6546	6561	6564	2696			TLRT706PM			
2	6	8211	375525	2696	6563	6562	6561	6546		TLRT706PM			
2	6	8311300375467		6546	6561	6562	6565	2456	6566	6567	2697	6568	TLRT707-0
2	6	8411300375467		6568	6565	6562	6561	6546			TLRT707-1		
2	6	8512300375494		6571	6553	6556	6569	2451	6570		TLRT709		
2	6	8612300429560		6571	6580	6581	6582	6572	6577	6576	6574	6575	TLRT710
2	6	8712300300271		6571	6553	6572	6577	6578	6579		TLRT711		
2	6	8811300300525		6571	6580	6581	6582	6583	6584	6585		TLRT712-0	
2	6	8911300300525		6585	6583	6581	6580	6571			TLRT712-1		
2	6	9012266375525		6571	6553	6572	6573	6574	6575		TLRT720		
2	6	9111300375467		6571	6553	6586	6587	6588	6589	6590	6591	TLRT721-0	
2	6	9211300300467		6591	6589	6588	6587	6586	6553	6571		TLRT721-1	
2	6	9312600500840		6505	6518	6519	2669	6592	6593		TINT-STON		
2	6	9411999999750		6505	6507	6513	6516	6517	6540	7050	2677	2678	INT-EAST
2	6	9421		7040	7041	7042	7043	7044	7045	7046		TINT-EAST	
2	6	9511999999750		7046	7047	7048	7049	2675	6540	6517	6516	6513	INT-EAST
2	6	9521		6507	6505							TINT-EAST	
2	6	9612	999999	6505	6523	6524	6526	2674	6595	6599	6496	6497	CROCKER
2	6	9622		6596	6597	6498	6598	2671	6603	6602	6610	7005	CROCKER
2	6	9632		7006	7007							TCROCKER	
2	6	9712600		6505	6523	6524	6526	2674	6595	6599	6496	2672	CROCKER
2	6	9722		6594	6603							TCROCKER	
2	6	9812	999	6571	6553	7058	6559	2455	7008	7009	7010	7011	BLNCHRD
2	6	9822		7012	7013	7014	7015	7016	7017	7019	7018		TBLNCHRD
2	6	9911999999999		6571	6553	6556	6557	6558	2454	7020	7021	7024	BLNCHRD
2	6	9921		7012	7025	7017	7019					TBLNCHRD	
2	6	610011600750840		7019	7017	7025	7012	7013	7011	7024	7021	7020	BLNCHRD
2	6	610021		2454	6558	6557	6556	6553	6571			TBLNCHRD	
2	6	610111999999999		6571	6553	6556	6557	6558	7026	2453	7027	7021	BLNCHRD
2	6	610121		7024	7012	7022	7023	7017	7019			TBLNCHRD	
2	6	610212600750600		6571	6580	6581	6582	6572	6573	6574	2449	7028	MARINEL
2	6	610222		7029	7030	7031	7032					TMARINEL	
2	6	610312600750600		6571	6553	6586	6587	6588	2448	6590	6591	7033	MARINEL
2	6	610322		2457	2447	7034						TMARINEL	
2	6	610412600750600		6571	6546	6561	6562	6563	2696	7035	6567	6566	PIERCE
2	6	610422		7036	7037	7038	7039					TPIERCE	
2	6	610512600600600		2470	7051	7052	7053	7056	7057			TMICHAUD	
2	6	610612999600750		7057	7056	7053	2465	7054	7055			TMICHAUD	
2	6	610712 40 40 40		1851	7150							THBLUMASS	
2	6	610812100100100		1805	6805							TMASSPORT	
2	6	610912300300600833		5342	5343	2400	6625	6626				THBL HULL	
2	6	611012600999600		2310	6448	6782						TFRAM-TEM	
2	6	611111999 999		2310	6427	6449	6451					TFRAM-SAX	
2	6	611212999999999		6451	6427	2310						TSAX-FRAM	
2	6	611311999999		6451	6477	6479	6655	6449	6427	2310		TSAX-FRAM	
2	6	611411999999		2310	6448	6655	6479	6477	6451	6656		TFRAM-MAN	
2	6	611511999 999		6656	6451	6678	6679	6479	6655	6449	6427	2310	TMAN-FRAM
2	6	611612999400999		2310	6448	6655	6479	6679	6685			TFRAM-NOB	

2 7 111250150300	5671 5670 5669 2699 5205 5202	T55
2 7 211250150300	5202 5201 1920 2699 5669 5670 5671	T55
2 7 311150180300	1883 5207 5209 5210 5211 5213 5319 5313 5312	68-1
2 7 321	5310 5311 5306 5307	T68-1
2 7 411150180300	5307 5309 5310 5312 5313 5319 5213 5211 5210	68-1
2 7 421	5205 5202 5203 1883	T68-1
2 7 511300350300	1826 5303 5307 5309 5310 5312 5313 1825 5314	49-3
2 7 521	5322 1824	T49-3
2 7 611300350300	1824 5321 5315 1825 5313 5312 5310 5309 5308	49-3
2 7 621	5307 5306 1826	T49-3
2 7 711100100150	1828 5653 5655 5657 5658 5663 2533 5320 5212	43-1
2 7 721	5319 5318 5317 5331 5332 5206 5341 1846	T43-1
2 7 811100100150	1846 1881 5331 5317 5318 5319 5212 5320	43-1
2 7 821	2533 5663 5658 5657 5655 5653 1828	T43-1
2 7 911 50 80	1848 5324 5333 1802 5340 5339 5400 5338	T2-1
2 7 1011 50 80	5338 5400 5339 1800 5340 1802 5333 5330 5324	2-1
2 7 1021	1848	T2-1
2 7 1112 50 50100	1863 5247 1864 5240 2634 5200 1920 2699 1945	1
2 7 1122	5320 1826 2531 5668 1827	T1
2 7 1211 80 80150	5645 5650 5646 5647 5652 1849 2692 5316 5315	9-4
2 7 1221	5314 5317 5318 5208 5207 1883	T9-4
2 7 1311 80 80150	1883 6033 1882 5317 5314 5315 5316 2692 1849	9-4
2 7 1321	5652 5647 5646 5650 5645	T9-4
2 7 1411 70 80150	5644 5643 5642 5649 5641 5640 5648 1849 2692	11
2 7 1421	5316 5315 5314 5322	T11
2 7 1511 70 80150	5322 5321 5315 5316 2692 1849 5648 5640 5641	11
2 7 1521	5649 5642 5643 5644	T11
2 7 16111220220	5866 5865 5864 5863 2691 5325 1848 5328 5329	6-1
2 7 1621	5334 5335 1821	T6-1
2 7 1711220220	1821 5336 5335 5334 5329 5330 5324 1848 5325	6-1
2 7 1721	2691 5863 5864 5865 5866	T6-1
2 7 1812110150200	1848 5325 2691 5863 5864 5865 5651 5646 5650	7
2 7 1822	5645	T7
2 7 1912150200300	6077 2524 5638 5639 1850 2527 5300 2529 2530	8-4
2 7 1922	5303 1826 2531 5668 1827	T8-4
2 7 2012100130200	5645 5650 5646 5647 5640 1850 2527 5300 2529	10
2 7 2022	2530 5303 1826 2531 5668 1827	T10
2 7 2111150150200	1864 5241 5243 5242 2635 5673 2698 1905 1922	47-2
2 7 2121	5672 2535 1947 5659 2534 5658 6078 1827 5668	47-2
2 7 2131	5304 5303 5307	T47-2
2 7 2211150150200	5307 5309 5310 5311 5306 1826 2531 5668 1827	47-2
2 7 2221	6078 5658 2534 5659 1947 2535 5672 1922 1905	47-2
2 7 2231	2698 5673 2635 5242 5246 1864	T47-2
2 7 2312150200300	1804 5215 5216 5221 5217 1806	T121
2 7 2412 80150200	5214 1804 5215 5220 5217 1806 5223 1807 6040	120
2 7 2422	5224	T120
2 7 2512150120240	1804 5215 5216 5222 2592 5218 5293 2588 5298	117-5
2 7 2522	5299 5717 5718 6034 1810 6036 1811	T117-5
2 7 2612150200240	1804 5215 5216 5222 2592 5218 5293 2588 5298	116-4
2 7 2622	5729 5721 5722 5723 5715 5719 6036 1811	T 116-4

2	7	2712300300300	1804	5215	5216	5222	2592	6409	5218	2595	5296	112-2
2	7	2722	5701	6042	5703	2598	5708	5709	5710	5711	1838	T112-2
2	7	2811200200400	2590	6035	1809	5716	5299	5729	5721	5725		T119
2	7	2911200200400	5725	5722	5721	5729	5299	5716	1809	5728	2590	T119
2	7	3012200200200	1811	6036	1810	6034	5718	5717	5299	5729	5726	110
2	7	3022	2585	5295	5297	5296	5701	5700	2601	1837		T110
2	7	3112600600	5714	2590	5728	1809	6035	1810	6036	5719	5720	410
2	7	3122	2477	5564	6064	2202						T410
2	7	3212300300	2487	5727	5724	5723	5722	5721	5729	5299	5717	411
2	7	3222	5718	6034	1810	6036	1811					T411
2	7	3311050070150	1821	5336	5335	5337	2633	2594	5290	5218	5293	111-5
2	7	3321	5294	2586	2585	5295						T111-5
2	7	3411050070150	5295	2596	2586	5294	5293	5218	5290	2594	2633	111-5
2	7	3421	5337	1821								T111-5
2	7	3512 80120300	1836	5274	2602	5700	5701	6042	5703	2598	5708	104-1
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2	7	3812100150300	1837	2601	5700	5701	6042	2599	2600	5712	5711	99-9
2	7	3822	1838	6080	5736	2607						T 99-9
2	7	3912100150200	1837	2601	5700	5713	2600	5712	7160	1838	5711	106
2	7	3922	5710	5733	5731	5732	2490	5531				T106
2	7	4011150180300	1837	6051	6052	2611	5737	1838	5711	5710	5733	108-6
2	7	4021	5731	5730	7156	2486	2487					T108-6
2	7	4111150180300	2487	7156	5730	5731	5733	5710	5711	1838	5737	108-6
2	7	4121	2611	6052	6051	1837						T108-6
2	7	4212200200350	2603	5730	5731	5733	5710	5711	1838			T107
2	7	4312250250450	1838	5711	5712	2600	2599	6042	5701	5700	2602	97-4
2	7	4322	5274	1836								T97-4
2	7	4412100100200	1837	6051	5741	2610	2609	5738	5739	5878	5740	T100-3
2	7	4512600700700	1838	5711	5710	5733	5731	5730	2603	2485	5541	430
2	7	4522	6068	6066	5544	5543	5542	6007				T430
2	7	4612300300600	5540	6008	5542	5543	5545	2479	5548	5560	5561	428
2	7	4622	6062	2202								T428
2	7	4712600	2202	5569								T431
2	7	4812300300600	5551	5552	5553	5559	5561	6062	2202			T433
2	7	4912300300600	6065	5570	5555	5566	5565	6061	6062	2202		T456
2	7	5012300300300	5554	5569	5568	5565	6061	6062	2202			T437
2	7	5112150200300	5686	1910	2569	5695	5608	5607	5475	5600	5602	51
2	7	5122	6079	2563	5479	5478	2562	5471	5470	5469	5468	51
2	7	5132	5415	5610	1830	2540	1953					T51
2	7	5212120250450	1830	1953	2541	5611	5437	2556	5429	6032	5425	21
2	7	5222	5424	5423	1855							T21
2	7	5312040040150	2336	5409	5420	2558	5416	2335	5610	1830	2540	32
2	7	5322	1953									T32
2	7	5412200300300	5415	5416	5417	2555	5418	1862				T30
2	7	5512450450450	7158	5413	2557	2560	5414	5415	5610	1830	2540	40
2	7	5522	1953									T40

2	7	5612090090120	1827	5625	5624	5622	5621	5612	T44			
2	7	5712090100120	1827	5625	5626	5628	5619	2543	2542	2544	5439	T45-1
2	7	5812240240240	1828	5612	2542	2544	5454	5455	5618	5629	5630	16-1
2	7	5822	5633	5635	2526	1850						T16-1
2	7	5912120120220	1827	5627	1828							T42
2	7	6012060090150	1827	5625	5626	2532	5632	5633	5630	5631		T15
2	7	6112090090120	1828	5612	2542	2544	5439	2545	2546	5432	5429	29
2	7	6122	5428	5426	1862							T29
2	7	6212200300300	1953	2540	1830	5610	2335	5417	2555	5418	1862	T28
2	7	6312150250400	2337	5404	2336	5604	5408	5419	2554	1862		T31
2	7	6412300300300	1827	5656	5654	5655	5664	5661				T46
2	7	6512100100170	1827	5656	5654	5653	5662	1950	7658	1951	5614	41
2	7	6522100100170	5615									T
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2	7	6622	5694	6611	5677	5678	5679					T66
2	7	6712100200	1827	5625	5624	5623	5620	2543	5455	5450	1853	T19
2	7	6812050080130	1827	5625	5624	5623	5620	2543	5454	5436	2548	23
2	7	6822	1855									T23
2	7	6912070100130	1827	5625	5624	5623	5620	2543	2542	2544	5439	22
2	7	6922	2545	2546	5433	2548	1855					T22
2	7	7012300300600	1850	2525	5634	5637	5636	5451	1853	5449	2549	18
2	7	7022	1855									T18
2	7	7112090120150	1850	2526	5635	5633	5630	5631	5452	5450	1853	T17
2	7	7212120120200	1855	2548	5424	5425						T25
2	7	7312300300300	1855	5423	2404	5421	1862					T27
2	7	7411070130200	5425	6032	6031	5431	2548	1855				T26
2	7	7611600	5427	5437	2545	2546	5434	5436	5450	5452	5631	48-1
2	7	7621	5630	5633	5632	2532	5626	5625	1827			T48-1
2	7	7712150300600	1862	2554	5419	5408	5604	2336	5403	5402	5401	33-6
2	7	7722	2406	6043								T33-6
2	7	7811150250400	5405	5606	5604	5408	5419	2554	1862			T24
2	7	7911180200300	2336	5410	2559	5412	5414	5415	5610	1830	2540	50
2	7	7921180200300	1953									T50
2	7	8011150160230	5466	2561	5470	2539	5616	5615	5614	2540	1830	38
2	7	8021	1953	1829								T38
2	7	8111800900800	5496	2568	5601	5498	5867	5603	5484	5489	2567	59-4
2	7	8121	5499	5482	6079	5602	2565	2564	5600	5475	2538	59-4
2	7	8131	5617	5616	5615	5614	2540	1830				T59-4
2	7	8212 300	5496	2568	5601	5608	5696	5609	5665	1924	2537	60
2	7	8222	2536	2535	5672	1921						T60
2	7	8311200200400	1852	5636	5637	5634	5635	2528	5300	2529	5303	13-1
2	7	8321	1826									T13-1
2	7	8412050050150	5461	5868	5413	2557	2560	5414	5415	5610	1830	34
2	7	8422	2540	1953								T34
2	7	8512120150300	5461	5460	5462	5459	5463	5464	2561	5467	5415	35
2	7	8522	5610	1830	2540	1953						T35
2	7	8612060070300	5458	5459	5463	5464	2561	5467	5415	5610	1830	36
2	7	8622	2540	1953								T36
2	7	8711120150300	5480	6090	5481	2323	5463	5464	2561	5467	5415	37
2	7	8721	5610	1830	2540	1953						T37

2 7 8812040050090	5831 2648 5805 5819 2650 5693 5801 5689 5684 57
2 7 8822	5698 5679 5678 1892 6041 1891 5673 1890 6053 57
2 7 8832	1921
2 7 8912600600600	1866 5504 5365 5364 5366 5348 1868 T212-2
2 7 9012080200400	1868 5348 7159 5501 5503 T214-1
2 7 9112100140	1895 2570 5686 1894 5685 1893 5677 1892 6041 58
2 7 9122	1891 5673 1890 6053 1921
2 7 9212200250300	5688 5689 5684 5803 5685 5676 1908 5675 5667 65
2 7 9222	5666 1924 2537 2536 2535 5672 1921 T65
2 7 9311150150	5242 5246 1864 T67
2 7 9412150150300	1868 5352 5358 5359 5368 5360 2574 5378 5377 215-1
2 7 9422	2403 5442 5441 5423 1855 T215-1
2 7 9512080200400	1868 5348 7159 5501 5502 T216
2 7 9612120200300	1868 5348 5351 2572 5347 6221 2571 5345 5344 220
2 7 9622	5343 5342 T220
2 7 9712800800800	1868 5348 5351 2572 5347 6221 5346 T221
2 7 9812130200300	1868 5348 5351 2572 5347 5891 5349 5350 T222
2 7 9911600600600	1868 5352 6099 6097 5353 6096 5357 T228
2 710012350300300	1866 5504 5367 5366 5348 1868 T210-2
2 710112300300600	6105 6106 6104 1866 5375 5374 5500 1867 5348 211
2 710122	1868 T211
2 710212300300600	1855 5423 2404 1858 5379 5378 2574 5360 5500 217-1
2 710222	1867 5367 5365 5364 5363 5362 T217-1
2 710311070130200	1855 2548 5431 6031 5425 T26
2 710411600600600	5357 2433 6095 5358 5352 1868 T228
2 710512200150300	1953 2540 1830 5610 5415 5414 2560 2557 5413 34-6
2 710522	5868 5461 2408 5517 2655 6126 2341 6127 2342 34-6
2 710532	6129 T34-6
2 710711600	1827 5625 5626 2532 5632 5633 5630 5631 5452 48-1
2 710721	5450 5436 5434 2546 2545 5437 5427 T48-1
2 710811150250400	1862 2554 5419 5408 5604 5606 5406 5405 T24
2 710911150160230	1829 5613 5614 5615 5616 2539 5470 2561 5466 T38
2 711011800900800	1830 2540 5614 5615 5616 5617 2538 5475 5600 59-4
2 711021	2564 2565 5602 6079 5482 5498 5867 5603 5484 59-4
2 711031	5489 2567 5499 5601 2568 5496 T59-4
2 711111200200400	1826 5303 2529 5300 2528 5635 5633 5637 5636 13-1
2 711121	1852 T13-1
2 711211120150300	1953 2540 1830 5610 5415 5467 2561 5464 5463 37
2 711221	2323 5481 5480 T37
2 711311150150	1864 5241 5243 5242 T67
2 711412150150300	1868 5352 5358 6095 1869 2434 5398 6128 1870 T230
2 711512150150600	1868 5352 5358 6095 1869 2434 5398 6128 1870 230-3
2 711522	5391 5392 2426 5394 5395 T230-3
2 711611400200600	1868 5352 6099 6098 6097 5353 2423 5354 5892 225-1
2 711621	5356 5355 T225-1
2 711711400200600	5355 5354 2423 5353 6097 6098 6099 5352 1868 T225-1
2 711811200200600	1868 5352 6099 6097 6096 5353 2423 5354 T225
2 711911200200600	5892 5356 5355 5354 2423 5353 6096 6097 6099 225
2 711921	5352 1868 T225
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2 712022	5388	5389	T237							
2 712112200300600	1868	5352	5358	6095	5399	5380	2428	5389	5388	238
2 712122	5387	2427	5386	5505	5385	7161	2430	2429	5383	238
2 712132	5381	1858	2404	5423	1855					T238
2 712212100150300	1855	5423	2404	1858	5381	5383	2429	2430	7161	240
2 712222100150300	5385	5505								T240
2 712312200250600	1855	5423	2404	1858	5381	5383	2429	2430	7161	240-1
2 712322	5385	5505	5507	2658						T240-1
2 712412300300600	1862	2405	5381	5379	5378	2574	5360	5511	1868	T245-4
2 712512300300	1853	6084	5447	2551	5444	2552	1866	5504	5367	210-3
2 712522	5366	5348	1868							T210-3
2 712612220250	1921	5672	2535	2536	2537	1924	5665			T60-1
2 712712200250	5496	2568	5601	5608	5696	5609	5665	1924	2537	60-5
2 712722	2536	2535	5672	1921						T60-5
2 712812240240200	1830	1953	2541	6150	2544	5454	5455	5618	5629	16UMASS
2 712822	5630	5633	5635	2526	1850	5639	5638	2524	6077	T16UMASS
2 713212120150150	1838	5737	2608	5738	5743	5744	5747	5748	6085	101-3
2 713222	5751	2614	5281	5273	2668	5274	1836			T101-3
2 713412200200	1837	2601	5700	5701	5296	5297	5295			T110-2
2 713512200200	1853	6084	6083	5448						T14
2 713611600600	1855	5423	2404	1858	5379	5378				T246
2 713711600600	5378	5383	5381	1858	2404	5423	1855			T246
2 713812300350450	2202	6064	2476	5914	5915					T439
2 714012600450	2204	6056	5581	2463	5579	2459	5577	5576	5907	468-4
2 714022	5583	5906	6125							T468-4
2 714111	999	5558	2204	5590	5908					T462
2 714211	999	5908	5909	5910	2204	5558				T462
2 714311100080	1853	6084	5447	2550	5446	5441	5443	5444		T20-1&6
2 714411100080	5443	5444	2551	5447	6084	1853				T20-1&6
2 714511	80200	1853	6084	5447	2550	5446	5441	5442	5443	T20-2
2 714611	80200	5443	5444	2551	5447	6084	1853			T20-2
2 714711	80	1853	6084	5447	2551	5444	5443			T20-7
2 714811	80	5443	5442	5441	2550	5447	6084	1853		T20-7
2 715112300400750	2202	6062	6061	5565	5568	6060	5554	5556		T436
2 715212300300600	5539	6009	2480	5546	5547	6121	5550	5552	5553	429
2 715222	5563	6061	6062	2202						T429
2 715312300300300	5547	5546	5549	6123	5559	5553	5563	6061	6062	432
2 715322	2202									T432
2 715412550999999	1838	5711	5710	5735	2492	6069	5526	5527	2496	133
2 715422	6029	5528	2500	6026	5533	5538	5534	5535	6016	133
2 715432	2252									T133
2 715512200300	1838	5711	5710	5735	2492	6069	5530	6030	5526	T131
2 715611300300600	5530	5531	2490	5732	6039	5734	5735	5710	5711	130
2 715621	1838	6080	1839	2493	5529					T130
2 715711300300600	5529	2495	5519	2494	2493	1839	6080	1838	5711	130
2 715721	5710	5735	5734	6039	5732	2490	5531	5530		T130
2 715812600200600	1838	5711	5710	5735	2492	6069	5526	5527	2497	135
2 715822	2229	5524								T135
2 715912600600600	1838	5711	5710	5735	2492	6069	5526	5527	2497	136
2 715922	2229	5524	5525	2504	6012	2231	2506	2241		T136

2 716012600600600	1838	5711	5710	5735	2492	6069	5526	5527	2497	137
2 716022	2229	5524	2230	2503	5520	6012	6014			T137
2 716112600600600	1837	6051	5741	5742	5744	5745	5746	2510	2239	134-5
2 716122	2509	6016	2252	5536	5537					T134-5
2 716212600600600	1837	6051	5741	5742	5744	5745	5746			T134-6
2 716312120150	5743	5744	5747	5748	6085	5751	2614	5281	5273	101
2 716322	5274	1836								T101
2 716412120120200	5746	2237	5745	5744	5747	5752	2613	5282	5274	95
2 716422	1836									T95
2 716512150150300	1836	5274	5285	5289	5288	2633	5337	1821		T92-1
2 716612070080200	1836	5274	5285	5286	5287	5288	2633	5337	1821	T93
2 716712070060150	2620	5264	5265	5278	2614	5281	5273	5274	1836	T89
2 716812 80 90170	5855	5859	2619	2618	2617	5263	5280	2615	5265	80
2 716822	5278	2614	5276	5272	5270	5238	5239	2632	1875	T80
2 716912450500450	5259	5279	5284	5271	5270	5272	5273	5274	1836	T90
2 717012450330500	5259	5279	5278	2614	5276	5272	5273	5274	1836	T94
2 717112 60100170	2620	5264	5259	5279	5284	5271	5270	5238	5239	88
2 717122	2632	1875								T88
2 717212150150170	2620	5264	5259	5258	5257	5235	5236	5239	2632	87
2 717222	1875									T87
2 717312100250500	5257	5235	5237	2631	5227	5228	5229	1865		T85
2 717412 80160100	1864	5230	5231	2630	5237	5236	5238	2666	1836	T91
2 717512120120200	1864	5230	5231	2629	5234	5267	2627	2263	5261	83-1
2 717522	5262									T83-1
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2 717712080180150	1863	5248	5233	5231	5227	5225	1875			T69
2 717811150150300	1864	5244	2637	2636	5680	5679	5699	5683	5690	64
2 717821	5691	5692	5693							T64
2 717911150150300	5693	5692	5691	5690	5683	5699	5679	5680	2636	64
2 717921	5245	1864								T64
2 718011200250300	1864	5244	2637	5681	5800	5682	2649	5836	5835	70
2 718021	5831									T70
2 718111200250300	5831	5835	5836	2649	5682	5800	5681	2637	2636	70
2 718121	5245	1864								T70
2 718211200200300	1864	5244	2637	5681	5800	5682	5683	5697	5689	63
2 718221	5688	5802	5687	5686	1910					T63
2 718311200200300	1910	5686	5687	5802	5688	5689	5697	5683	5682	63
2 718321	5800	5681	2637	2636	5245	1864				T63
2 718412200300300	5237	5235	5234	2628	5233	5248	1863	2638	5681	86
2 718422	5680	5679								T86
2 718512 30 40100	2621	5260	5261	2263	5255	5248	1863	5249	5250	73
2 718522	2639	2640	5252	5834	5837	5838	2273			T73
2 718612070090100	1863	5249	5250	2639	7131	5833	5831			T71-3
2 718712120120300	5250	5269	5254	5248	1863					T72
2 718812100130300	1863	5248	5254	5266	5841	2690	5840	2272	6054	T74
2 718917120100300	1863	5248	5254	5266	5841	5465	5842	5843	5844	78
2 718921	2519	6055	5845							T78
2 719011120100300	5845	2519	5844	5842	5465	5841	5266	5254	5248	78
2 719021	1863									T78
2 719111120100300	1863	5248	5254	5266	5841	5465	5842	5843	5844	84

2 719121	2519	5846								T84
2 71921120100300	2516	5853	5846	6055	2519	5844	2624	2622	2621	84
2 719221	5260	5261	2263	5255	5248	1863				T84
2 719312040030070	1863	5248	5255	2263	5261	5260	2621	5857	5856	77
2 719322	5855	5854	5848	5847						T77
2 719411080070150	1863	5248	5255	2263	5261	5260	2626	5259	5265	96
2 719421	2615	5280	5263	5750	5749	5748	5747	5744		T96
2 719511080070150	5744	5745	5749	5750	5263	5280	2616	5265	5259	96
2 719521	2626	5260	5261	2263	5255	5248	1863			T96
2 719612150150	5855	5858	2620	5264	5259	5258	5256	5283	5235	87-2
2 719622	5236	5239	2632	1875						T87-2
2 719711200200300	1864	5244	2637	5681	5800	5682	2649	5836	5835	523-3
2 719721	5831	5832	2644	2287	2274	6005	6004	5902	6003	523-3
2 719731	6002									T523-3
2 719811200200300	6002	6003	5902	6004	6005	2274	2287	2644	5832	523-3
2 719821	5831	5835	5836	2649	5682	5800	5681	2637	2636	523-3
2 719831	5245	1864								T523-3
2 719912300350600	5435	2304	5828	5827	5824	2654	5903	5598	2274	527-1
2 719922	2645	2646	5820	5813	5818	5805	2648			T527-1
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2 720022	5825	2303	5814	5809	2302	5811	5813	5818	5805	520
2 720032	2648									T520
2 720112600600600	2273	2643	2287	6445	2274	5598	5597	2653	5824	521
2 720122	5825	2303	5814	5809	2302	5811	5813	5818	5805	T521
2 720212300350600	6025	2271	6024	2435	2270	6628	2269	6067	6019	529
2 720222	5592	2523	5847							T529
2 720312600600600	6023	2436	6021	6022	5593	5595	5594	2269	6067	528
2 720322	6019	5592	2516							T528
2 720412600600600	6022	6020	5594	2269	6067	6019	5591	2520	5852	530-5
2 720422	5850	5851	6091	5849	5854	5855				T530-5
2 720511650650600	2274	5596	6087	6086	6088	2517	6089	5593	5595	525-1
2 720521	6067	2269								T525-1
2 720611650650600	2269	5594	5595	5593	6089	2517	6088	6086	6087	525-1
2 720621	5596	2274								T525-1
2 720711600600600	6006	6004	6005	2274	5598	5597	2652	5823	5822	522-2
2 720721	5821	5810	5809	2302	5811	5813	5818	5805	2648	T522-2
2 720811600600600	5805	5818	5813	5811	5809	5810	5821	5822	5823	522-2
2 720821	2652	5597	5598	2274	6005	6006				T522-2
2 720912450450450	5831	2647	5820	5810	5809	2302	5812	5807	5492	532
2 720922	1931	5491	5490	2411	5512	2327	7180	2326		T532
2 721012 380	1848	5325	2691	5863	5864	5865	5866			T6
2 721112300300300	5458	6092	5483	5484	5497	5486	5485	5487	5488	533
2 721122	5493	1929	5808	5804	6046	5805	2648	5831		T533
2 721212400400600	2648	5805	5818	5813	5811	2302	5809	5814	2303	531
2 721222	5816	5830	5829	5494	6044	6045	2439	2307	6229	531
2 721232	2308	2445	2309	5815	2310					T531
2 721311300300600	2202	6062	6061	5565	5568	6060	5554	6101	6421	T-4350UT
2 721321	2470									TT-4350UT
2 721412600600600	2202	6062	6061	5565	5568	6060	5554	6101	2470	435-1
2 721422	5557	6057	6058	6011	2461	5576	5907			T435-1

2 721512 450999	2204 6056 5581 2463 5579 2459 5577 5576 5907	458-4
2 721522	5583 5906	T458-4
2 721612400300600	2204 5590 5910 5586 2458 5585 5584 6102	T451
2 721712 450999	2204 5590 5910 5909 5908 5587	T453
2 721812300300300	2204 5590 5589 6168 5913 2472 5571 2473 5555	
2 721822	5566 5565 6061 6062 2202	T
2 721912999 40999	2204 5590 5589 2464 5574 5912 5911	T454
2 722012 600	2204 5590 5588 5589 6168	T
2 722112 999999	5580 5581 2204	T457
2 722212300300600	5911 5912 5574 2466 5572 6059 5567 2474 5562	441-440
2 722222	6064 2202 5564 2477 5720 5719 6209 5718 2589	441-440
2 722232	6420 6804 6803 2593 6967 6838	T441-440
2 722312300300300	5911 5912 5574 2466 5572 6059 5567 2474 5562	442-440
2 722322	6064 2202 5564 2477 5720 5719 6209 5718 2589	442-440
2 722332	6420 6804 6803 2593 6967 6838	T442-440
2 722412600600	2202 6064 5562 2474 6120 5573	T444-2
2 722512 600	2487 5727 5724 5723 5722 5721 5729 5299 5716	412
2 722522	1809 5728 2590 5714	T412
2 722611200300600	6066 5544 5545 2479 5548 5560 5561 6062 2202	T426-C
2 722711100300600	2202 6062 5561 5560 5548 2479 5545 5544 6066	T426-C
2 722812200200400	5393 2658 5507 5505 5385 7161 2430 2659 5389	NEW-1
2 722822	5398 2434 1869	TNEW-1
2 722912200200400	1870 5391 5390 5384 5387 2427 5386 5505 5506	TNEW-2
2 723011200200400	5390 5391 1870 6128 5398 2434 1869 6095 5358	NEW-3
2 723021	5352 1868	TNEW-3
2 723111200200400	1868 5352 5358 6095 1869 2434 5398 5389 5388	NEW-3
2 723121	5390	TNEW-3
2 723212200200400	1868 5352 5358 6095 1869 2434 5398 6128 1870	NEW-4
2 723222	5391 5392 2426 5394 5395	TNEW-4
2 723312200200400	1870 6128 5391 5390 5384 5387 5386 5385 5505	NEW-5
2 723322	5506 5507 2658 5393	TNEW-5
2 723412200200400	5389 5388 5390 5391 1870 6128 5398 2434 1869	NEW-6
2 723422	6095 5358 5352 1868	TNEW-6
2 723512600600600	2273 2641 2642 2651 2287 6445 2274 5598 5597	521-WAR
2 723522	2653 5824 5825 2303 5814 5809 2302 5811 5813	521-WAR
2 723532	5818 5805	T521-WAR
2 723611300300600	2470 6101 5554 6060 5568 5565 6061 6062 2202	TT-435-1N
2 8 111150170	1934 6403 5209 1883	T303-INBD
2 8 211150170	1883 6403 1934	T303-OUTB
2 8 311 40 40	1934 6403 6405 5324 1847	T300-INBD
2 8 411 40 40	1847 6405 6403 1934	T300-OUTB
2 8 511100120	5831 2648 5805 6403 5209 1883	T302-INBD
2 8 611100120	1883 6403 5805 2648 5831	T302-OUTB
2 8 711 70 50150	5831 2648 5805 6403 6405 5324 1847	T304-INBD
2 8 811 70 50150	1847 6405 6403 5805 2648 5831	T304-OUTB
2 8 911 70 50600	5688 5689 5801 5693 2650 5819 6403 6405 5324	301-INBD
2 8 921	1847	T301-INBD
2 8 1011 70 50600	1847 6405 6403 5819 2650 5693 5801 5689 5688	T301-OUTB
2 8 1111150200700	2274 5597 5824 5828 5830 6403 6405 5324 1847	T305-INBD
2 8 1211150200700	1847 6405 6403 5830 5828 5824 5597 2274	T305-OUTB

2 8 1312 80 80	5740 5739 5738 5743 2612 1821	T326ELMST
2 8 1412 80 80	5746 2237 5745 5744 2612 1821	T325W.MED
2 8 1511150200600	2514 6417 2513 6415 2512 6416 2511 6418 5855	700-2 IN
2 8 1521	5857 7132 7133 1865 2694 6419 6863 6864 6862	700-2 IN
2 8 1531	5332	T700-2 IN
2 8 1611150200600	5332 6419 2694 1865 7133 7132 5857 5855 6418	700-2OUT
2 8 1621	2511 6416 2512 6415 2513 6417 2514	T700-2OUT
2 8 1711250120	2514 6417 2513 6415 2252 5534 5538 5533 6026	701-INBD
2 8 1721	2500 2499 2612 1821 6863 6864 6862 5332	T701-INBD
2 8 1811250120	5332 6419 6863 1821 2612 2499 2500 6026 5533	701-OUTB
2 8 1821	5538 5534 2252 6415 2513 6417 2514	T701-OUTB
2 8 1911160300600	2202 6062 5561 5560 5548 2479 5545 5544 6066	426-INBD
2 8 1921	2483 2486 7164 2587 6838	T426-INBD
2 8 2011240110600	6838 2587 7164 2486 2483 6066 5544 5545 2479	426-OUTB
2 8 2021	5548 5560 5561 6062 2202	T426-OUTB
2 8 2112150 80600	2204 6056 7055 5558 2471 5570 5569 5568 5563	450
2 8 2122	5561 5560 2478 2484 6422 5718 2589 6420 6804	450
2 8 2132	6803 2593 6967 6838	T450
2 8 2512150150300	2202 6062 5561 5560 2478 2484 6422 5718 2589	400
2 8 2522	6420 6804 6803 2593 6967 6838	T400
2 8 2911400999999	6439 2579 6440 2581 6441 2583 6442 2664 7162	RITCHIE
2 8 2921	2444 6444 6445 6446 5831 6408 6401 6945 5332	RITCHIE
2 8 2931	5323	TRITCHIE
2 8 3011999500999	5323 5332 6945 6401 6408 5831 6446 6445 6444	RITCHIE
2 8 3021	2444 7162 2664 6442 2583 6441 2581 6440 2579	RITCHIE
2 8 3031	6439	TRITCHIE
2 8 3112600600600	2578 6778 2580 6779 2582 6780 6781 6782 6783	GREYLINE
2 8 3122	6219 6784 6785 6786 2584 2683 7179 7165 2442	GREYLINE
2 8 3132	6410 2665 6401 6945 5332	TGREYLINE
2 8 3211400	6780 6781 6782 6783 6219 6784 6785 6786 2584	GREYLINE
2 8 3221	2683 7179 7165 2442 6410 2665 6401 6945 5332	TGREYLINE
2 8 3311150	6785 6786 2584 2683 7179 7165 2442 6410 2665	GREYLINE
2 8 3321	6401 6945 5332	TGREYLINE
2 8 3411 100	5332 6945 6401 2665 6410 2442 7165 7179 2683	GREYLINE
2 8 3421	2584 6786 6785 6784 6219 6783 6782 6781 6780	TGREYLINE
2 8 3511500750999	6211 6469 6470 6400 6471 6472 7168 7167 6473	ENGLANDR
2 8 3521	2437 2438 2695 2443 2442 6410 2665 6401 6945	TENGLANDR
2 8 3611999750999	6945 6401 2665 6410 2442 2443 2695 2438 2437	ENGLANDR
2 8 3621	6473 7167 7168 6472 6471 6400 6470 6469 6211	TENGLANDR
2 8 3711200999999	2410 6424 2684 6454 2518 6455 2685 6456 2625	BRUSH-HL
2 8 3721	6457 2553 6458 7181 2575 2577 2440 6412 2441	MILFORD-TBOSTON
2 8 3731	2442 6410 2665 6401 5332 5323	BRUSH-HL
2 8 3811600200999	5323 5332 6401 2665 6410 2442 2441 6412 2440	BOSTON-TMILFORD
2 8 3821	2577 2575 7181 6458 2553 6457 2625 6456 2685	
2 8 3831	6455 2518 6454 2684 6424 2410	
2 8 3911400999999	6700 2247 6923 7777 8191 6701 7166 6702 6703	T
2 8 3921	7176 6704 2481 6838 6863 6864 6862 5332 6945	
2 8 4011999380999	6945 6419 6863 6838 2481 6704 7176 6703 6702	
2 8 4021	7166 6701 8191 7777 6923 2247 6700	
2 8 4111400	6717 7173 6718 6249 6704 2481 6838 6863 6864	BOS-COM

2 8 4121		6862 5332 6945	TAMES-BOS
2 8 4211	380	6945 6419 6863 6838 2481 6704 6249 6718 7173	BOS-COM
2 8 4221		6717	TBOS-AMES
2 8 4311999		6731 7177 2460 7057 6705 2468 2481 6838 6863	HUDSON
2 8 4321		6864 6862 6945	TBEV-BOS
2 8 4411	999	6945 6419 6863 6838 2481 2468 6706 7057 2460	HUDSON
2 8 4421		7177 6731	TBOS-BEV
2 8 4511	600	6945 6419 6863 6838 2481 2468 6706 7057 6705	HUDSON
2 8 4521		6733	TBOS-PEAB
2 8 4611400		6733 6706 7057 6705 2468 2481 6838 6863 6864	HUDSON
2 8 4621		6862 6945	TPEAB-BOS
2 8 4711	900	6945 6419 6863 6838 2481 2468 6706 7057 6705	HUDSON
2 8 4721		6714 6732	TBOS-RUSL
2 8 4811999		6732 6714 6706 7057 6705 2468 2481 6838 6863	HUDSON
2 8 4821		6864 6862 6945	TRUSL-BOS
2 8 5011400600700		6840 6841 6842 6843 6844 6845 6846 6847 2243	TROMBLEY
2 8 5021		6848 6849 6850 6851 6852 2502 2501 2500 2499	LAWRANCE
2 8 5031		2612 1821 6863 6864 6862 5332	TTO BOSTN
2 8 5111600250700		5332 6419 6863 1821 2612 2499 2500 2501 2502	TROMBLEY
2 8 5121		6852 6851 6850 6849 6848 2243 6847 6846 6845	BOSTON-
2 8 5131		6844 6843 6842 6841 6840	TLAWRANCE
2 8 5211600700840		6433 2454 6827 6828 6613 6614 7174 7175 6851	TROMBLEY
2 8 5221		6852 2502 2501 2500 2499 2612 1821 6863 6864	LOWELL-
2 8 5231		6862 5332	TBOSTON
2 8 5311600750999		5332 6419 6863 1821 2612 2499 2500 2501 2502	TROMBLEY
2 8 5321		6852 6851 7175 7174 6614 6613 6828 6827 2454	BOSTON-
2 8 5331		6433	TLOWELL
2 8 5411999		6494 6495 2673 6496 6497 6498 2660 6707 6609	HBL WHIT
2 8 5421		6600 6710 2424 6649 6676 6677 2682 6607 2573	TO ASHMT
2 8 5431		6201 6615 6616 1855	T
2 8 5511	750	1855 6616 6615 6201 2573 6607 2682 6677 6676	HBL ASHT
2 8 5521		6649 2424 6710 6600 6609 6707 2660 6498 6497	TO WHITM
2 8 5531		6496 2673 6495 6494	T
2 8 5611999		6499 6609 6600 6710 2424 6649 6676 6677 2682	HBL SWEY
2 8 5621		6607 2573 6201 6615 6616 1855	T TO ASHT
2 8 5711600		6600 6710 2424 6649 6676 6677 2682 6607 2573	COL SQ
2 8 5721		6201 6615 6616 1855	T TO ASHT
2 8 5811	999	1855 6616 6615 6201 2573 6607 2682 6677 6676	HBL ASHT
2 8 5821		6649 2424 6710 6600 6609 6601 2661 2662 6602	TO ROCKD
2 8 5831		6603	T
2 8 5911300999999		6474 6475 2377 2681 2667 2680 6476 2773 6612	P&B
2 8 5921		2682 6607 2573 6608 2688 6984 6480 6504 2689	BROCKTON
2 8 5931		5323 6945	TTO BOSTN
2 8 6011999999300		6945 5323 2689 6504 6480 6984 2688 6608 2573	P&B
2 8 6021		6607 2682 6612 2773 6476 2680 2667 2681 2377	BOSTON-
2 8 6031		6475 6474	TBROCKTON
2 8 6111240600750		2432 6637 6638 2415 6639 6640 2417 6641 2421	P&B
2 8 6121		6642 2422 2424 6649 6676 6677 2682 6607 2573	DUX-BOS
2 8 6131		6608 2688 6984 6480 6504 2689 5323 6945	T(DX-PLY)
2 8 6211900180600		6945 5323 2689 6504 6480 6984 2688 6608 2573	P&B

2 8 6221	6607 2682 6677 6676 6649 2424 2422 6642 2421	BOS-DUX
2 8 6231	6641 2417 6640 6639 2415 6638 6637 2432	T(BOS-PL)
2 8 6311400	6629 6404 6631 6632 2416 6633 6635 6636	P&P
2 8 6321	6638 2415 6639 2418 2420 6642 2422 2424	SOUTH
2 8 6331	6676 6677 2682 6607 2573 6608 2688 6984	DUXBURY
2 8 6341	6504 2689 5323 6945	TTO BOSTN
2 8 6411 600	6945 5323 2689 6504 6480 6984 2688 6608	P&B
2 8 6421	6607 2682 6677 6676 6649 2424 2422 6642	BOSTON
2 8 6431	2418 6639 2415 6638 2413 6636 6635	TO SOUTH
2 8 6441	6632 6631 6404 6629	TDUXBURY
2 8 6511999 999	6634 6635 6636 2413 6638 2415 6639 6640	P&B
2 8 6521	6641 2421 6642 2422 2424 6649 6676 6677	MARSHFLD
2 8 6531	6607 2573 6608 2688 6984 6480 6504 2689	TO
2 8 6541	6945	TBOSTON
2 8 6611 999999	6945 5323 2689 6504 6480 6984 2688 6608	P&B
2 8 6621	6607 2682 6677 6676 6649 2424 2422 6642	BOSTON
2 8 6631	6641 2417 6640 6639 2415 6638 2413	TO
2 8 6641	6634	TMARSHFLD
2 8 6711999	7171 6638 2415 6639 6640 2417 6641 2421	P&B
2 8 6721	2422 2424 6649 6676 6677 2682 6607	PEMBROKE
2 8 6731	2688 6984 6480 6504 2689 5323 6945	TTO BOSTN
2 8 6811 999	6945 5323 2689 6504 6480 6984 2688 6608	P&B
2 8 6821	6607 2682 6677 6676 6649 2424 2422 6642	BOSTON-
2 8 6831	6641 2417 6640 6639 2415 6638 7171	TPEMBROKE
2 8 6911170750999	6643 6644 6645 6646 2419 6647 2446 6648	P&B
2 8 6921	6642 2422 2424 6649 6676 6677 2682 6607	SCITUATE
2 8 6931	6608 2688 6984 6480 6504 2689 5323 6945	TTO BOSTN
2 8 7011999180999	6945 5323 2689 6504 6480 6984 2688 6608	P&B
2 8 7021	6607 2682 6677 6676 6649 2424 2422 6642	BOSTON-
2 8 7031	6648 2446 6647 2419 6646 6645 6644 6643	TSCITUATE
2 8 7111600	2243 6848 6849 6850 6851 6852 2502 2501	TROMBLEY
2 8 7121	2499 2612 1821 6863 6864 6862 5332	TANDV-BOS
2 8 7212600600600	6950 6951 6952 6955 6476 2773 6612 2682	BONANZA
2 8 7222	2573 6608 2688 6984 6480 6504 2689 7106	TFOX-LOGN
2 8 7311300999999	6500 6501 2679 6502 6503 2676 2377 2681	ALMEIDA
2 8 7321	2680 6476 2773 6612 2682 6607 2573 6608	BROCKTON
2 8 7331	6984 6480 6504 2689 6945	TTO BOSTN
2 8 7411999300999	6945 2689 6504 6480 6984 2688 6608 2573	ALMEIDA
2 8 7421	2682 6612 2773 6476 2680 2667 2681 2377	BOSTON-
2 8 7431	6503 6502 2679 6501 6500	TBROCKTON
2 8 7511600750999	6930 6931 6932 6933 6934 6935 6936 6937	ABC106 I
2 8 7521	6126 6939 2408 2560 1830 6940 6941 6942	ABC106 I
2 8 7531	6944 6945	TABC106 I
2 8 7611999750840	6945 6942 6941 6940 1830 2560 2408 6939	ABC106 O
2 8 7621	6938 6937 6936 6935 6934 6933 6932 6931	TABC106 O
2 8 7711400750	6749 6750 5528 6751 6831 2499 6857 2612	HBL STON
2 8 7721	1836	TTO SULLV
2 8 7811400380	1836 6859 2612 6857 2499 6831 6751 5528	HBL SULL
2 8 7821	6749	TTO STONH
2 8 7911240	2355 6955 6476 2773 6612 5389 2682 6607	HUDRT128

2 8 7921	6608 2688 6984 6480 6504 2689 6838	TTOHAY-KT
2 8 8011999	6707 6609 6600 6710 2424 6649 6676 6677 2682	HUDSON
2 8 8021	6607 2573 6608 2688 6984 6480 6504 2689 6838	TWEY-HAY
2 8 8112750750	6707 6609 6600 6710 5355 2423 5354 6619 6620	HUDSON
2 8 8122	6621 6622 5398 6677 2682 6607 2573 6608 2688	FACTPANT
2 8 8132	6984 6480 6504 2689 6838	TTOHAYMKT
2 8 8211999	6609 6600 6710 2424 6649 6676 6677 5376 5389	HUDSON
2 8 8221	6612 2682 6607 2573 6608 2688 6984 6480 6504	COL.SQ.
2 8 8231	2689 6838	THAYMARKT
2 8 8311999	6609 6600 6710 5355 2423 5354 6619 6620 6621	HUDSON
2 8 8321	6622 5398 6677 2682 6607 2573 6608 2688 6984	COL.SQ.
2 8 8331	6480 6504 2689 6838	THAYMARKT
2 8 8412999999	5342 7141 5350 5349 6627 2423 6619 6620 6621	HUDSON
2 8 8422	6622 5398 6677 2682 6607 2573 6608 2688 6984	HINGHAM
2 8 8432	6480 6504 2689 6838	THAYMRKT
2 8 8511 999	6838 2689 6504 6480 6984 2688 6608 2573 6607	HUDSON
2 8 8521	2682 6677 6676 6649 2424 6710 6600 6609	THAY-WEY
2 8 8611 999	6838 2689 6504 6480 6984 2688 6608 2573 6607	HUDSON
2 8 8621	2682 6612 5389 5376 6677 6676 6649 2424 6710	HAYMRKT
2 8 8631	6600 6609 6707	TTO FACTP
2 8 8711300	6411 2431 6461 6460 6459 6447 5381 5383 5378	BRUSHILL
2 8 8721	5377 6608 2688 6984 6480 6504 2689 5323 6945	TCANT-BOS
2 8 8811750	6945 5323 2689 6504 6480 6984 2688 6608 5377	BRUSHILL
2 8 8821	5378 5383 5381 6447 6459 6460 6461 2431 6411	TBOS-CANT
2 8 8911 240	6838 2689 6504 6480 6984 2688 6608 2573 6607	HODHAY-K
2 8 8921	2682 5389 6612 2773 6476 6955 2355	TTOTRE128

C.3.1 CTPS.QNET80.MODEN.LISTED.RENODEX

The nodes used for each mode are listed in Tables C-2-1 through C-2-8. A short summary of the number of records processed for each mode, the number of unused nodes, and the number of nodes used for each particular mode is given at the end of each mode from 1 to 8. The node numbers are summarized whenever continuous node numbers are used--1944-1953, for example; a single value is printed--2696, for example--whenever a node number is used but not in a continuous sequence.

MODE 1, which is the walk link, includes all nodes which have a walk link connection as well as all the centroids from which a walk link is used to connect a transit node. Note that not all centroids have a walk link connecting them to either a transit, bus, or railroad station; the indication is that the walk node link is much greater than 1/2 mile. These centroids are connected by auto connector to usually more than one transit, bus, or railroad station.

In MODE 2, the auto penalty portion of the auto connectors, the first 60 centroids, which are the CBD centroids, do not have any auto connectors. Centroids 61-592 all have at least one auto connector to either a transit, bus, or railroad station.

MODE 3 includes the nodes used for the auto connector links between the auto penalty and the transit, bus, or railroad station.

MODE 4 shows the railroad portion of the transit network. The railroad network is represented by 98 links using 93 separate nodes.

In MODE 5, the rapid rail mode, there are 95 links using 100 different nodes.

The private bus section of the transit inventory is represented by MODE 6. In this mode, 507 links using 465 separate nodes for 115 different lines are noted.

The largest number of lines is found in MODE 7, the MBTA bus and trackless trolley system, in which 227 lines are used, with 1,140 links using 940 different node numbers.

Express buses, both private and MBTA, are MODE 8, which has 333 links using 319 different nodes.

The MODE 1 links have additional data on nearly all of the walk links beyond the requirements for UNET. Except for a small number of links, which will be noted later on, all walk links are coded as two-way links; that is, column 40 on the transit link data card is set at "2." Thus, columns 41-80 are not used for the UNET building of the network. Some of these columns have been utilized to present other information used to determine the

ctps.qnet80.summary.mode1.listed.renode80

0001-0393 0396-0485 0488-0490 0492-0494 0499-0505 0507-0513 0516-0525 0527-0543
0546 0548-0560 0562 0566-0568 0573-0574 0576 0582-0587 0589-0590 1800-1807 1809
-1811 1820-1830 1835-1839 1845-1871 1875-1883 1890-1895 1905-1910 1920-1934 1944
-1953 2200 2202-2212 2214-2216 2226-2231 2237-2239 2241-2243 2245 2247-2248 2250
-2252 2263-2282 2287 2300-2310 2319-2327 2335-2347 2355-2358 2363-2364 2404-2405
2411 2445 2450 2470 2477 2480 2487 2492 2509 2514 2519 2525-2526 2528-2529 2532
-2537 2542-2544 2546 2548 2551-2552 2555 2557 2559 2561 2564 2569 2585-2586 2590
2592 2595 2597-2603 2607 2610 2614 2617-2622 2639 2641-2642 2645-2646 2668 2686
2690 2696 2699 5200-5203 5205-5225 5227-5247 5249-5250 5252 5254-5267 5269-5274
5276 5278-5281 5283-5290 5293-5300 5303 5306-5308 5310-5315 5317-5325 5329-5335
5337-5341 5348-5349 5351-5360 5362 5364-5366 5374 5377-5378 5380-5381 5383-5384
5386 5388 5392-5395 5398-5400 5402 5404 5408 5410 5412-5421 5424-5429 5431-5434
5436-5437 5439 5441 5443-5444 5446 5448-5452 5454-5455 5458 5462-5464 5467 5470
5475 5478 5481 5485 5488-5489 5491-5501 5504-5506 5509-5512 5517 5519-5521 5524
-5531 5533 5535-5574 5577 5579-5581 5583-5598 5600-5603 5608-5612 5614 5616 5618
-5636 5638-5643 5646-5666 5668-5672 5674-5681 5685 5689-5690 5693-5701 5703-5721
5723-5747 5750-5752 5800-5805 5807-5814 5816 5818-5829 5831-5838 5840-5841 5844
-5845 5847-5849 5852-5859 5864 5902-5903 5906 5908 5910-5915 6004-6005 6011 6026
6032 6036 6042 6057-6058 6066 6077 6088 6106 6125 6150 6209 6219 6229 6249 6404
6409 6415-6418 6420 6422-6427 6429-6435 6439-6445 6448-6449 6451 6454-6459 6461
-6464 6466-6471 6473-6475 6479 6483 6485-6486 6489 6492-6493 6495 6497-6503 6505
6546 6566 6570-6571 6591 6593-6594 6597 6599-6601 6603-6606 6617-6619 6621 6623
6625-6627 6629 6631-6638 6640-6648 6656 6678-6679 6700-6704 6717-6718 6731-6733
6750-6751 6768 6770 6772 6774 6778-6782 6785 6805-6806 6823 6826 6838 6840 6845
6848 6866 6869-6870 6875 6880 6882 6888 6891 6893 6899-6900 6913-6914 6918 6922
6928 6930 6933-6936 6938 6945 6950 7005 7007-7008 7010 7017 7021 7030 7034 7038
7042 7044 7049 7051-7057 7131-7134 7143 7150 7161 7171 7173

THERE ARE 2050 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-

1 -8192

THERE ARE 6679 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 1513 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode2.listed.renod80

0061-0592 1727 1730-1734 1737 1740-1769 1771-1774 1776-1793 1795 1797-1799 1812
-1819 1831-1834 1840-1844 1872-1874 1885-1888 1896-1898 1900-1903 1911-1919 1935
-1938 1940 1942-1943 1954-1983 1985 1987 1989-2028 2031-2033 2035-2126 2129 2132
2134 2136 2138 2140 2143 2145 2148 2150 2152 2154 2156 2158 2161 2163 2165 2168
2170 2172 2174 2176 2178 2181 2183 2185 2187 2189 2191 2193 2196 2198 2201 2217
2219 2221 2223 2225 2233 2235 2240 2246 2255 2257 2259 2261 2283 2285 2289-2290
2292-2293 2295-2296 2298 2311 2313 2315-2317 2329 2331 2333 2348-2349 2351 2353
-2354 2361 2365 2367 2369-2371 2374 2376 2379 2382 2384 2387 2390 2392 2394 2397
2399 2402 2475 2491 2521 2566 2576 2663 2701 2703 2705-2706 2708 2710 2712 2714
2716 2718 2720 2722 2724 2726 2728 2730 2732 2734 2736 2738 2740 2742-2743 2745
2748 2750 2752 2754 2757 2759 2761 2763 2765-2766 2768 2770 2774 2776 2778 2781
2783 2785 2787 2790 2793 2795 2797 2799 2801 2804 2806 2808 2810 2812 2815 2817
2819 2822 2824 2826 2828 2830 2832 2834-2835 2837 2839 2841 2843 2845 2847-2849
2852-2853 2855 2857 2859 2861-2864 2866-2867 2869 2871-2873 2875 2877 2879-2884
2887-2889 2891 2893 2895 2897 2899 2901 2903 2905-2906 2908 2910-2911 2913 2915
2917 2920 2923 2929 2932 2934-2935 2937-2938 2941-2944 2947 2949-2951 2953 2955
2957 2959 2961 2965 2967 2969 2971 2973 2975 2977 2979-2980 2982 2984 2987 2990
2993 2999 3002-3003 3005 3007-3008 3010 3012 3014 3017 3020 3026 3029 3031-3033
3035 3037 3040 3046 3049 3051-3053 3056 3058 3060 3062 3065 3071 3074 3076-3078
3081 3084 3090 3093 3095 3097 3099-3100 3103 3106 3109 3115 3118 3120 3122 3124
3126 3128 3131 3134 3137 3140 3142 3145 3148 3151 3154 3156 3158 3161 3164 3167
3169 3171 3173 3175 3177 3179 3181 3183 3185 3187 3189 3191 3193 3195 3198 3200
3203 3206 3208 3210 3212 3214 3216-3218 3220 3222 3224 3226 3228 3230 3232 3234
-3235 3237 3239 3241 3243 3245-3247 3249 3251 3253 3255-3256 3258 3260 3262-3268
3270 3272 3274 3276-3277 3279-3283 3286 3288 3290 3292-3293 3295 3297 3299-3301
3304-3307 3310 3313 3315-3316 3319 3322-3324 3327-3329 3331 3333-3340 3342 3344
3346 3348 3350-3358 3360-3363 3365-3374 3376 3378 3380-3381 3383-3388 3390 3392
3394 3396-3401 3404 3406 3408 3410-3414 3416 3418 3420 3422-3423 3425 3427-3431
3433 3435 3437 3439 3441 3443-3451 3453-3466 3468-3471 3473-3475 3477 3479 3481
3483 3485 3487 3489 3491 3493 3495-3496 3498 3500 3502 3504 3506 3508 3510 3512
3514-3515 3517 3519 3521 3523 3525 3527 3529 3531 3533 3535 3537 3539-3542 3544
-3545 3547-3548 3550 3552-3553 3555 3557 3559-3565 3567 3569 3571-3574 3576 3578
-3580 3582-3600 3602 3604 3606 3608-3612 3614 3616 3618 3620-3623 3625-3627 3629
3631 3633 3635 3637 3639-3640 3642-3645 3648 3650-3653 3656 3658 3660 3662 3664
3666 3668-3671 3673 3675 3677-3681 3683 3685-3687 3689 3691-3694 3696 3698 3700
-3710 3712 3714 3716-3719 3721 3723-3725 3727 3729 3732 3735 3737 3742 3744-3748
3750 3752 3754 3756 3758 3762 3764-3765 3767 3769 3771 3773-3775 3777 3779 3783
3786 3788-3789 3791-3793 3796 3802 3805-3808 3810 3813 3819 3822-3826 3829 3832
3835 3841 3844-3847 3849-3853 3856 3859 3862 3868 3871-3875 3878 3881 3887 3890
-3905 3907-3909 3911 3913-3915 3917 3919-3923 3925-3929 3931-3935 3937-3940 3942
-3946 3948-3952 3954-3957 3959-3962 3964-3967 3969 3971 3973 3975 3977 3979-3988
3990-3996 3998-4010 4012-4086 4088 4090-4092 4094-4099 4101-4102 4104-4107 4109
4111 4113 4115 4117-4124 4126-4131 4133 4135-4138 4140-4163 4165 4167 4169-4178
4180 4182 4184-4192 4194 4196 4198-4308 4311 4314 4317 4323 4326-4329 4331 4333
4336 4342 4345-4351 4353 4355 4357 4361 4363-4366 4368 4370 4372 4374 4376-4378
4380 4382 4384 4388 4390-4394 4396 4398 4400 4402 4404-4406 4408 4410 4412 4416

4418-4422 4424 4426 4428 4432 4434-4437 4439 4441 4443 4449 4452 4454-4456 4458
4460 4462 4466 4468-4471 4473 4475 4477 4481 4483-4486 4488 4490 4492 4494 4496
-4498 4500 4502 4504 4506 4508-4511 4513 4515 4517 4519-4521 4523 4525 4527 4529
4531-4541 4543 4545 4547-4558 4560 4562 4565 4571 4574-4579 4581 4583 4585 4589
4591 4593-4594 4596 4598 4600-4601 4603 4605 4607 4611 4613-4620 4622 4624 4626
4630 4632-4636 4638 4640 4642 4646 4648-4651 4653 4655 4657 4661 4664-4667 4669
4671 4673 4675 4678-4680 4682 4684 4686 4688 4690-4691 4693 4695 4697 4699 4701
-4703 4705 4707 4709 4711 4715 4717 4719 4721 4723 4725-4727 4729 4731 4733 4735
4739 4741 4743-4746 4748 4750 4752 4754 4756 4760 4762-4763 4765-4767 4769 4771
-4772 4774 4776 4778 4780 4782 4786 4788 4790 4792 4794-4795 4797 4799-4800 4802
4804 4806 4808 4810 4814 4816-4821 4823 4825 4827 4829 4833 4835-4840 4842 4844
4846 4850 4852-4859 4861 4863 4865 4869 4871-4886 4888 4890 4892 4896 4898-4908
4910-4923 4926 4928-4938 4940-4965 4967-4989 4991-4997 4999 5001-5005 5007 5009
-5015 5017-5051 5055-5059 5061-5063 5065 5067 5069-5073 5075 5077-5082 5084-5087
5089 5091 5093-5097 5099 5101 5103-5109 5111-5115 5117-5119 5204 5226 5251 5253
5268 5275 5277 5291 5301-5302 5305 5326-5327 5361 5369-5373 5382 5396-5397 5411
5422 5430 5438 5440 5445 5453 5456-5457 5473-5474 5476-5477 5508 5513-5514 5516
5518 5522-5523 5532 5575 5578 5582 5599 5605 5702 5753-5799 5806 5817 5839 5860
-5862 5869-5870 5872-5877 5879 5881-5887 5889-5890 5893-5896 5898-5899 5901 5916
-5919 5921-5926 5928-5932 5934-5937 5939-5944 5946-5949 5951-5968 5970-6001 6013
6017-6018 6027-6028 6047 6049 6063 6070-6076 6081-6082 6093-6094 6100 6103 6107
-6119 6122 6124 6130-6149 6151-6167 6170 6172-6178 6180 6182 6184 6188 6190-6199
6202-6208 6210 6212-6218 6220 6222-6228 6230 6232-6238 6240 6242-6248 6250 6252
-6258 6260 6262-6268 6270 6272-6373 6375-6380 6382-6387 6389-6399 6407 6413-6414
6421 6478 6525 6650-6654 6657-6664 6666 6668-6671 6674 6680-6682 6687-6690 6693
-6696 6699 6715-6716 6719-6721 6723-6726 6728-6730 6734-6748 6752-6756 6765 6787
6791-6801 6829-6830 6832-6837 6839 6853-6855 6861 6947-6949 6953-6954 6956-6962
6970-6977 6981-6983 6985-7004 7059-7068 7070-7104 7107 7109-7129 7135-7139 7142
7144-7149 7151-7154 7157 7163 7169-7170 7182-7224 7226 7228-7229 7231-7233 7235
-7236 7239-7241 7243-7244 7247 7249-7250 7252-7253 7255 7257-7258 7260 7262-7264
7266-7267 7270-7273 7277-7299 7301-7308 7310-7316 7318-7327 7329-7613 7616-7618
7621-7623 7627 7630-7632 7636 7639 7643 7646 7650-7651 7654 7656 7660 7666 7672
7678-7680 7684 7687-7689 7695-7697 7701 7704-7735 7739-7740 7744-7750 7754-7763
7767-7776 7779-7787 7791-7792 7796-7797 7801-7804 7808-7811 7815-7817 7821-7822
7826-7827 7833-7835 7839-7841 7845-7850 7854-7858 7862 7864-7866 7870 7872-7876
7880 7884 7890-7891 7897 7903-7904 7908 7912 7919-7920 7927 7933-7934 7938 7944
-7945 7949-7951 7958-7960 7964-7967 7971-7973 7977-7979 7983-7984 7988-7989 7995
-7997 8003-8005 8009-8012 8017-8020 8024-8027 8030-8032 8035-8037 8040-8041 8044
-8045 8048 8051-8052 8055-8057 8060-8062

THERE ARE 3330 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-

1 -8192

THERE ARE 4330 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 3862 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode3.listed.renod80

1725-1799 1804-1807 1809-1819 1825-1844 1848-1875 1884-1888 1890-1943 1945-2028
2031-2033 2035-2159 2161-2199 2201-2236 2238-2252 2254-2285 2288-2299 2301-2376
2378-2385 2387-2399 2401-2402 2414 2469 2475 2482 2491 2505 2507 2514 2521 2547
2566 2576 2623 2656 2663 2700-2772 2774-2895 2897-2906 2908-2911 2913-2923 2927
-2935 2937-2961 2964-2980 2982-2993 2997-3008 3010-3020 3024-3040 3044-3065 3069
-3084 3088-3109 3113-3737 3740-3758 3761-3779 3782-3796 3800-3813 3817-3835 3839
-3862 3866 3868-3881 3885-4317 4321-4336 4340-4357 4360-4384 4387-4412 4415-4428
4431-4443 4447-4462 4465-4477 4480-4565 4569-4585 4588-4607 4610-4626 4629-4642
4645-4657 4660-4711 4714-4735 4738-4756 4759-4782 4785-4810 4813-4829 4832-4846
4849-4865 4868-4892 4895-4908 4910-4923 4925-4938 4940-4965 4967-4999 5001-5051
5054-5199 5204 5226 5251 5253 5268 5275 5277 5291 5301-5302 5305 5326-5327 5350
5361 5369-5373 5382 5396-5397 5411 5422 5430 5438 5440 5445 5453 5456-5457 5472
-5474 5476-5477 5508 5513-5516 5518 5522-5523 5532 5575 5578 5582 5599 5605 5702
5753-5799 5806 5817 5839 5855 5860-5862 5869-5877 5879-5890 5893-5899 5901 5916
-6001 6010-6011 6013 6015 6017-6018 6027-6028 6037 6047-6050 6063 6070-6076 6081
-6082 6093-6094 6100 6103 6107-6119 6122 6124 6130-6149 6151-6167 6169-6199 6202
-6208 6210 6212-6218 6220 6222-6228 6230 6232-6238 6240 6242-6248 6250 6252-6258
6260 6262-6268 6270 6272-6373 6375-6380 6382-6387 6389-6399 6407 6413-6414 6416
6420-6422 6424-6429 6431 6433 6439-6443 6454-6458 6470-6471 6473-6475 6478 6495
6497 6499 6501-6503 6525 6600 6603 6609 6628 6637-6638 6642 6648 6650-6654 6657
-6664 6666-6671 6674-6675 6680-6682 6686-6690 6693-6696 6699-6700 6702-6703 6715
-6717 6719-6721 6723-6731 6733-6748 6752-6756 6765 6778-6779 6782 6785 6787 6791
-6801 6829-6830 6832-6837 6839 6845 6848 6853-6855 6861 6934-6936 6938 6947-6949
6953-6954 6956-6962 6970-6977 6981-6983 6985-7004 7059-7104 7107-7129 7135-7139
7142 7144-7149 7151-7154 7157 7163 7169-7170 7182-7224 7226 7228-7229 7231-7233
7235-7236 7239-7241 7243-7244 7247 7249-7250 7252-7253 7255 7257-7258 7260 7262
-7264 7266-7267 7270-7273 7277-7299 7301-7308 7310-7316 7318-7327 7329-7613 7616
-7618 7621-7623 7627 7630-7632 7636 7639 7643 7646 7650-7651 7654 7656-7657 7659
-7660 7666 7672 7678-7680 7684 7687-7689 7695-7697 7701 7704-7735 7739-7740 7744
-7750 7754-7763 7767-7776 7778-7787 7791-7792 7796-7797 7801-7804 7808-7811 7815
-7817 7821-7822 7826-7827 7833-7835 7839-7841 7845-7850 7854-7858 7862 7864-7866
7870 7872-7876 7880 7884 7890-7891 7897 7903-7904 7908 7912 7919-7920 7927 7933
-7934 7938 7944-7945 7949-7951 7958-7960 7964-7967 7971-7973 7977-7979 7983-7984
7988-7989 7995-7997 8003-8005 8009-8012 8017-8020 8024-8027 8030-8032 8035-8037
8040-8041 8044-8045 8048 8051-8052 8055-8057 8060-8062

THERE ARE 4247 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-

1 -8192

THERE ARE 3715 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 4477 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode4.listed.renod80

2200 2202-2212 2214-2216 2226-2231 2237-2239 2241 2245 2247-2253 2263-2282 2286
-2287 2300-2310 2319-2327 2335-2338 2340-2347 2355-2358 2363-2364

THERE ARE 98 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-
1 -8192

THERE ARE 8099 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 93 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode5.listed.renod80

1800-1807 1809-1811 1820-1830 1835-1839 1845-1871 1875-1883 1890-1895 1905-1910
1920-1934 1944-1953

THERE ARE 95 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-
1 -8192

THERE ARE 8092 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 100 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode6.listed.renod80

1805 1807 1851 1855 1862 1924 1945-1947 2210-2212 2243 2245 2248 2252 2273 2307
2310 2338-2339 2363-2364 2400 2404-2405 2407 2409 2412 2419 2423 2425 2428-2429
2431 2447-2457 2465 2470 2488 2498 2508 2514-2515 2522 2568 2573 2591 2604-2607
2643 2657-2658 2660-2662 2669-2675 2677-2678 2686 2696-2697 5209-5210 5332 5342
-5343 5349-5350 5354 5381 5384 5388-5389 5393 5395 5398 5458 5488 5496 5507 5528
5601 5608-5609 5659-5660 5696 5714 5739-5740 5743-5744 5868 5878 5892 6029 6088
6200-6201 6231 6401 6415 6417 6424-6438 6448-6449 6451 6459-6468 6477 6479 6482
-6490 6492-6499 6505-6524 6526-6606 6609-6610 6615-6622 6624-6627 6630 6655-6656
6678-6679 6685 6700 6749-6750 6757-6764 6766-6777 6782 6805-6826 6840-6841 6843
-6847 6865-6928 7005-7058 7130 7140-7141 7150 7155

THERE ARE 507 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-
1 -8192

THERE ARE 7727 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 465 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode7.listed.renod80

1800 1802 1804 1806-1807 1809-1811 1821 1824-1830 1836-1839 1846 1848-1850 1852
-1853 1855 1858 1862-1870 1875 1881-1883 1890-1895 1905 1908 1910 1920-1922 1924
1929 1931 1945 1947-1948 1950-1951 1953 2202 2204 2229-2231 2237 2239 2241 2252
2263 2269-2275 2287 2302-2304 2307-2310 2323 2326-2327 2335-2337 2341-2342 2403
-2406 2408 2411 2423 2426-2430 2433-2436 2439 2445 2458-2459 2461 2463-2464 2466
2470 2472-2474 2476-2477 2479-2480 2485-2487 2490 2492-2497 2500 2503-2504 2506
2509-2510 2516-2517 2519-2520 2523-2546 2548-2552 2554-2565 2567 2569-2572 2574
2585-2586 2588-2590 2592-2603 2607-2611 2613-2622 2624 2626-2655 2659 2666 2668
2690-2692 2698-2699 5200-5203 5205-5218 5220-5225 5227-5250 5252 5254-5267 5269
-5274 5276 5278-5290 5293-5300 5303-5304 5306-5322 5324-5325 5328-5341 5343-5349
5351-5360 5362-5368 5374-5375 5377-5381 5383-5392 5394-5395 5398-5406 5408-5410
5412-5421 5423-5429 5431-5437 5439 5441-5444 5446-5452 5454-5455 5458-5471 5475
5478-5494 5497-5507 5511-5512 5517 5519-5520 5524-5531 5533-5574 5576-5577 5579
-5581 5583-5598 5600-5604 5606-5695 5697-5701 5703-5739 5741-5752 5800-5805 5807
-5816 5818-5825 5827-5838 5840-5859 5863-5868 5878 5891-5892 5902-5903 5906-5915
6002-6009 6011-6012 6014 6016 6019-6026 6029-6036 6038-6046 6051-6062 6064-6069
6077-6080 6083-6092 6095-6099 6101-6102 6104-6106 6120-6121 6123 6125-6129 6150
6168 6209 6221 6229 6409 6420-6422 6445 6611 6628 6803-6804 6838 6967 7131 7156
7158-7161 7180 7658

THERE ARE 1140 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-
1 -8192

THERE ARE 7252 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 940 NODES USED FOR THIS MODE IN THE RANGES CHECKED

ctps.qnet80.summary.mode8.listed.renod80

1821 1830 1836 1847 1865 1883 1934 2243 2247 2252 2274 2355 2377 2408 2410 2413
2415-2424 2431-2432 2437-2438 2440-2444 2446 2454 2460 2462 2467-2468 2471 2478
2481 2483-2484 2486 2489 2499-2502 2511-2513 2518 2553 2560 2573 2575 2577-2584
2587 2612 2625 2660 2664-2665 2667 2676 2679-2685 2687-2689 2693-2695 2697 2773
5209 5321 5323-5324 5332 5354-5355 5376-5377 5381 5389 5398 5528 5534 5558 5560
-5561 5563 5568-5570 5597 5739-5740 5743-5744 5805 5819 5824 5826 5828 5830-5831
5855 5857 6056 6066 6126 6211 6219 6249 6400-6406 6408 6410-6412 6415-6419 6422
6424 6433 6439-6442 6444-6447 6450 6452 6454-6459 6469-6476 6480-6481 6497-6498
6500-6504 6600 6607-6609 6612-6614 6619 6627 6629 6631-6649 6676-6677 6700-6714
6717-6718 6731-6733 6750-6751 6778-6786 6803 6805 6827-6828 6831 6838 6841-6846
6848-6852 6857 6859-6860 6862-6864 6923 6930-6945 6950-6952 6955 6964-6967 6984
7055 7057 7105-7106 7132-7133 7162 7164-7168 7171-7179 7181 7777 8191

THERE ARE 353 RECORDS IN THE FILE. THE NODES CHECKED ARE GIVEN BY-
1 -8192

THERE ARE 7873 UNUSED NODES IN THE RANGE CHECKED.

THERE ARE 319 NODES USED FOR THIS MODE IN THE RANGES CHECKED

User's Guide to CTPS Transit Network	CTPS.QNET80.SUMMARY.MODE8.LISTED.RENOD80	CTPS
Technical Report 49 April 1985		TABLE C-2-8

data for the walk link cards. This information is presented as follows:

<u>Columns</u>	<u>Data</u>
65 - 68	Distance from centroid to station, in feet (estimate)
70 - 72	Market area distance to station, in feet (estimate)
73 - 75	Town code number
76 - 78	Walk time from centroid to station, tenth of minutes (estimate)
79 - 80	Percent of market area people and jobs within a one-third-mile radius of the station, integer 0 for none to 00 for 100 percent (estimate)

The estimates are exactly that--educated, "eye-balled" estimates based upon personal knowledge, experience and, in some cases, visits to the areas involved. Furthermore, these data have only been used in a few instances and may have been under- or over-estimated. Use these data with extreme caution until they are proven to be reliable. It is felt that the distances presented are fairly reliable, except for transcription errors; however, the percentage calculations are not as reliable and represent only an educated guess. They should be used accordingly.

C.3.2 CTPS.QNET80.MODEN.LISTED.LINES

A brief description and summary of the lines used in QNET80 are presented in Tables C-3-1 through C-3-6. The format is as follows:

<u>Column</u>	<u>Description of Item in the Column</u>
1	Mode
2-4	Line Number
5	Space
6	Oneway=1, Twoway=2
7	Space
8-30	ANODE/Station Name and/or Stop
31-52	BNODE/Station Name and/or Stop
53-56	ANODE/Station Number

<u>Column</u>	<u>Description of Item in the Column</u>
57	Space
58-61	BNODE/Station Number
62	Space
63-80	If MODE 4: Railroad Line Name If MODE 5: MBTA Line Name If MODE 6: Private Carrier Name If MODE 7: MBTA Route Number If MODE 8: MBTA Express Bus Route Number or Express Bus Carrier Name

There are MODE 4 - MODE 8 lines listed in the tables which have been sorted on line number (columns 2-4). An additional set of MODE 7 lines have been sorted on MBTA route number for cross-reference purposes (columns 63-80). Braintree extension bus routes have been arbitrarily assigned the numbers 992-999 for convenience. The station names are given by the MBTA schedule maps. Special notes are assigned wherever space permitted.

MODE 8 lines represent express bus routes; both MBTA and private-carrier routes are listed.. An express bus is one which, though it may operate as a local bus in the outlying areas, proceeds with no scheduled stops until reaching or nearing the CBD.

CTPS.QNET80.TABLE.SUMMARY.MODE4

4 1 1	BOSTON	ROCKPORT	2200	2212	BOSTON & MAINE RR
4 2 1	ROCKPORT	BOSTON	2212	2200	BOSTON & MAINE RR
4 3 1	BOSTON	IPSWICH	2200	2216	BOSTON & MAINE RR
4 4 1	IPSWICH	BOSTON	2216	2200	BOSTON & MAINE RR
4 5 2	BOSTON	READING	2200	2231	BOSTON & MAINE RR
4 6 1	BOSTON	LOWELL AM PEAK	2200	2250	BOSTON & MAINE RR
4 7 1	BOSTON	WOBURN EXPRESS	2200	2252	BOSTON & MAINE RR
4 8 1	BOSTON	LOWELL	2200	2250	BOSTON & MAINE RR
4 9 1	BOSTON	WOBURN	2200	2250	BOSTON & MAINE RR
4 10 1	LOWELL	BOSTON	2250	2200	BOSTON & MAINE RR
4 11 1	WOBURN	BOSTON	2252	2200	BOSTON & MAINE RR
4 12 1	BOSTON	WOBURN OFF PEAK SER	2200	2252	BOSTON & MAINE RR
4 13 1	WEST MEDFORD	BOSTON	2237	2200	BOSTON & MAINE RR
4 14 2	BOSTON	BEDFORD	2200	2271	BOSTON & MAINE RR
4 15 2	WINCHESTER	BOSTON	2200	2239	BOSTON & MAINE RR
4 16 2	BOSTON	BEAVERBROOK & CLEMENT	2200	2287	BOSTON & MAINE RR
4 17 2	BOSTON	HAVERHILL	2200	2248	BOSTON & MAINE RR
4 18 2	BOSTON	SOUTH ACTON OFF PEAK	2200	2282	BOSTON & MAINE RR
4 19 2	BOSTON	SOUTH ACTON PEAK	2200	2282	BOSTON & MAINE RR
4 20 2	SOUTH ACTON OFF PEAK	BOSTON	2282	2200	BOSTON & MAINE RR
4 21 1	SOUTH ACTON PEAK	BOSTON	2282	2200	BOSTON & MAINE RR
4 30 1	BOSTON	FRAMINGHAM	2300	2310	PENN CENTRAL RR
4 31 1	BOSTON	FRAMINGHAM	2300	2310	PENN CENTRAL RR
4 32 1	FRAMINGHAM	BOSTON	2310	2300	PENN CENTRAL RR
4 33 1	PROVIDENCE	BOSTON	2358	2300	PENN CENTRAL RR
4 34 1	CANTON JUNCTION	BOSTON	2356	2300	PENN CENTRAL RR
4 35 1	READVILLE	BOSTON	2337	2300	PENN CENTRAL RR
4 36 1	BOSTON	PROVIDENCE	2300	2356	PENN CENTRAL RR
4 37 1	BOSTON	CANTON JUNCTION	2300	2358	PENN CENTRAL RR
4 38 1	BOSTON	READVILLE	2300	2337	PENN CENTRAL RR
4 39 1	NEEDHAM	BOSTON	2327	2300	PENN CENTRAL RR
4 40 1	BOSTON	NEEDHAM	2300	2327	PENN CENTRAL RR
4 41 1	FRANKLIN	BOSTON	2347	2300	PENN CENTRAL RR
4 42 2	NORWOOD PEAK SER	BOSTON	2342	2300	PENN CENTRAL RR
4 43 1	BOSTON	FRANKLIN	2300	2347	PENN CENTRAL RR
4 44 1	STOUGHTON	BOSTON	2364	2300	PENN CENTRAL RR
4 45 1	BOSTON	STOUGHTON	2300	2364	PENN CENTRAL RR

CTPS.QNET80.TABLE.SUMMARY.MODE5

5 1 2 BOWDOIN	WONDERLAND	1800	1811	BLUE LINE
5 2 2 OAK GROVE	FOREST HILLS	1839	1830	ORANGE LINE
5 3 2 HARVARD SQUARE	ASHMONT	1863	1855	RED LINE ASHMONT
5 4 2 NORTH STATION	RIVERSIDE	1877	1934	GREEN L RIVERSIDE
5 5 2 PARK STREET STATION	ARBORWAY	1880	1953	GREEN L ARBORWAY
5 6 2 LECHMERE	CLEVELAND CIRCLE	1875	1910	GREEN L CLEVELAND
5 7 2 LECHMERE	BOSTON COLLEGE	1875	1895	GREEN L BC & LECH
5 8 2 MATTAPAN	ASHMONT(TROLLEY STOP)	1862	1871	RED LINE ASH-MATT
5 10 2 BRAINTREE	HARVARD SQUARE	1870	1863	RED L EXT SO BRA

CTPS.QNET80.TABLE.SUMMARY.MODE6*****START

6 1 1 MILFORD	FRAMINGHAM	6424	6428	BIG W TRANS
6 2 1 FRAMINGHAM	MILFORD	6428	6424	BIG W TRANS
6 3 2 MATTAPAN	STOUGHTON	1862	2364	BRUSH-HILL TRANS
6 4 1 MATTAPAN	PARKWAY WEST LOOP	1862	2686	BRUSH-HILL TRANS
6 5 2 MATTAPAN	CANTON	1862	2687	CANTON-BLUE HILLS
6 6 2 WAVERLY	WALTHAM VIA TRAPELLO	6088	2273	METROPOLITAN CHCH
6 7 1 ORIENT HEIGHTS	POINT SHIRLEY HIGHLDS	1807	6482	RAPID TRANSIT INC
6 8 1 POINT SHIRLEY	ORIENT HTS-HIGHLANDS	6482	1807	RAPID TRANSIT INC
6 9 1 POINT SHIRLEY	ORIENT HTS-CENTER	6482	1807	RAPID TRANSIT INC
6 10 1 ORIENT HEIGHTS	POINT SHIRLEY-CENTER	1807	6482	RAPID TRANSIT INC
6 11 1 WINTHROP HIGHLANDS	SHIRLEY POINT	5714	6482	RAPID TRANSIT INC
6 12 1 SHIRLEY POINT	WINTHROP HIGHLANDS	6482	5714	RAPID TRANSIT INC
6 13 1 ASHMONT	WHITMAN	1855	6494	HUDSON BUS LINES
6 14 1 WHITMAN	ASHMONT	6494	1855	HUDSON BUS LINES
6 15 1 ROCKLAND	ASHMONT	6603	1855	HUDSON BUS LINES
6 16 1 ASHMONT	ROCKLAND	1855	6603	HUDSON BUS LINES
6 17 1 SO WEY COL SQ	ASHMONT	6609	1855	HUDSON BUS LINES
6 18 1 ASHMONT	COL SQ SO WEYMOUTH	1855	6609	HUDSON BUS LINES
6 19 1 SO WEY COL SQ	ASHMONT	6609	1855	HUDSON BUS LINES
6 20 1 ASHMONT	COL SQ SO WEYMOUTH	1855	6609	HUDSON BUS LINES
6 21 1 HINGHAM	ASHMONT	5342	1855	HUDSON BUS LINES
6 22 1 ASHMONT	HINGHAM	1855	5342	HUDSON BUS LINES
6 23 1 EAST WEYMOUTH	ASHMONT	5350	1855	HUDSON BUS LINES
6 24 1 ASHMONT	EAST WEYMOUTH	1855	5350	HUDSON BUS LINES
6 25 2 STONEHAM	MEDFORD SQUARE	6759	5744	HUDSON BUS LINES
6 26 2 MEDFORD SQ	UPPER HIGHLANDS	5744	2607	HUDSON BUS LINES
6 27 2 MANOR	SPRING STREET DEDHAM	6705	4587	HUDSON BUS LINES
6 28 2 ENDICOTT	GROVE & WASHINGTON	2339	6777	HUDSON BUS LINES
6 29 2 ENDICOTT	SPRING STREET	2339	5458	HUDSON BUS LINES
6 30 1 ACTION ROUTE NO 1		6826	6806	ACTION, INC.
6 31 1 ACTION ROUTE NO 2		6806	6826	ACTION, INC.
6 32 2 ACTION ROUTE NO 3A		6826	6823	ACTION, INC.
6 33 1 ACTION ROUTE NO 3B		6806	6826	ACTION, INC.
6 34 2 ACTION ROUTE NO 4A		6806	6821	ACTION, INC.
6 35 1 ACTION ROUTE NO 4B		6826	6806	ACTION, INC.
6 36 1 LOWELL	LAWRENCE	6433	6845	TROMBLEY MOTOR
6 37 1 LAWRENCE	LOWELL	6845	6433	TROMBLEY MOTOR
6 38 1 PLEASANT VALLEY	TOWN FARM	6874	6881	TROMBLEY MOTOR
6 39 1 PLEASANT VALLEY	TOWN FARM	6881	6874	TROMBLEY MOTOR
6 40 1 BEACON STREET	LAWRENCE STREET	6883	6888	TROMBLEY MOTOR
6 41 1 BEACON STREET	LAWRENCE STREET	6883	6888	TROMBLEY MOTOR
6 42 1 TOWER HILL	BELT CENTRAL	6845	6897	TROMBLEY MOTOR
6 43 1 TOWER HILL	BELT CENTRAL	6897	6845	TROMBLEY MOTOR
6 44 1 WATER STREET	PROSPECT HILL	7140	6864	TROMBLEY MOTOR
6 45 1 WATER STREET	PROSPECT HILL	6894	7140	TROMBLEY MOTOR

6 46 2 LAWRENCE ANDOVER	NORTH ANDOVER	6899	6873	TROMBLEY MOTOR
6 47 2 LAWRENCE ANDOVER	NORTH ANDOVER	6899	6845	TROMBLEY MOTOR
6 48 2 RED		6900	6916	BOSTON COMMUTER
6 49 1 BLUE		6900	6922	BOSTON COMMUTER
6 50 1 GREEN		6900	6922	BOSTON COMMUTER
6 51 1 GREEN		6922	6900	BOSTON COMMUTER
6 53 1 YELLOW		6900	6926	BOSTON COMMUTER
6 53 1 YELLOW		6926	6900	BOSTON COMMUTER
6 54 1 ORANGE		6900	6914	BOSTON COMMUTER
6 55 1 ORANGE		6900	6914	BOSTON COMMUTER
6 56 1 LOWELL	BILLERICA	6433	6437	VOCELL BUS CO
6 57 1 BILLERICA	LOWELL	6437	6433	VOCELL BUS CO
6 58 1 BOSTON	FRAMINGHAM	5332	2310	WELLESLEY FELLS
6 59 1 FRAMINGHAM	BOSTONS	2310	5332	WELLESLEY FELLS
6 60 2 BAT ROUTE NO. 1		6505	2657	BROCKTON AREA TR
6 61 2 BAT ROUTE NO. 2		6505	6511	BROCKTON AREA TR
6 62 2 BAT ROUTE NO. 2A		6505	6511	BROCKTON AREA TR
6 63 2 BAT ROUTE NO. 3		6505	6517	BROCKTON AREA TR
6 64 1 BAT ROUTE NO. 4 OUT		6505	6521	BROCKTON AREA TR
6 65 1 BAT ROUTE NO. 4 IN		6521	6505	BROCKTON AREA TR
6 66 2 BAT ROUTE NO. 4A		6505	6521	BROCKTON AREA TR
6 67 2 BAT ROUTE NO. 5		6505	2674	BROCKTON AREA TR
6 68 2 BAT ROUTE NO. 6		6505	6529	BROCKTON AREA TR
6 69 2 BAT ROUTE NO. 7		6605	5395	BROCKTON AREA TR
6 70 2 BAT ROUTE NO. 8		6605	6535	BROCKTON AREA TR
6 71 2 BAT ROUTE NO. 9		6605	6540	BROCKTON AREA TR
6 72 2 BAT ROUTE NO. 10		6506	6542	BROCKTON AREA TR
6 73 2 BAT ROUTE NO. 11		6505	6532	BROCKTON AREA TR
6 74 2 BROCKTON	ASHMONT	6505	1855	BROCKTON AREA TR
6 76 2 LRT ROUTE NO. 703		6571	2450	LOWELL REG TRANS
6 77 2 LRT ROUTE NO. 704		6546	6552	LOWELL REG TRANS
6 78 2 LRT ROUTE NO. 705		6546	6560	LOWELL REG TRANS
6 79 1 LRT ROUTE NO. 706	AM OUT	6546	2696	LOWELL REG TRANS
6 80 1 LRT ROUTE NO. 706	AM IN	2696	6546	LOWELL REG TRANS
6 81 1 LRT ROUTE NO. 706	PM OUT	6546	2696	LOWELL REG TRANS
6 82 1 LRT ROUTE NO. 706	PM IN	2696	6546	LOWELL REG TRANS
6 83 1 LRT ROUTE NO. 707	PM OUT	6546	6548	LOWELL REG TRANS
6 84 1 LRT ROUTE NO. 707	PM IN	6568	6546	LOWELL REG TRANS
6 85 2 LRT ROUTE NO. 709		6571	6570	LOWELL REG TRANS
6 86 2 LRT ROUTE NO. 710		6571	6570	LOWELL REG TRANS
6 87 2 LRT ROUTE NO. 711		6571	6579	LOWELL REG TRANS
6 88 1 LRT ROUTE NO. 712	OUT	6571	6785	LOWELL REG TRANS
6 89 1 LRT ROUTE NO. 712	IN	6585	6511	LOWELL REG TRANS
6 90 2 LRT ROUTE NO. 720		6571	6575	LOWELL REG TRANS
6 91 1 LRT ROUTE NO. 721	OUT	6571	6591	LOWELL REG TRANS
6 92 1 LRT ROUTE NO. 721	IN	6591	6571	LOWELL REG TRANS
6 93 2 BROCKTON	STOUGHTON	6505	6592	INTERSTATE TRANS
6 94 1 BROCKTON	EASTON	6505	7046	INTERSTATE TRANS
6 95 1 EASTON	BROCKTON	7046	6505	INTERSTATE TRANS
6 96 2 BROCKTON	HANOVER MALL	6505	7007	CROCKER TRANS

6 97 2 BROCKTON	WHITMAN/ABINGTON	6505	6603	CROCKER TRANS
6 98 2 LOWELL	TEWKSBURY STATE HOSP	6571	7018	BLANCHARD BUS LNS
6 99 1 LOWELL	TEWKSBURY MAIN ST	6571	7019	BLANCHARD BUS LNS
6100 1 TEWKSBURY	LOWELL MAIN ST	7019	6571	BLANCHARD BUS LNS
6101 1 LOWELL	TEWKSBURY WHIPPLE RD	6571	7019	BLANCHARD BUS LNS
6102 2 LOWELL	CHELMSFORD CENTER	6571	7032	MARINEL TRANSPORT
6103 2 LOWELL	NO CHELMSFORD	6571	7034	MARINEL TRANSPORT
6104 2 LOWELL	DRACUT	6571	7039	PIERCE
6105 2 LAKE SHORE PARK	NO SHORE SHOPPING CTR	2470	7057	MICHAUD BUS LINES
6106 2 LAKE SHORE PARK	SALEM CENTER	7057	7055	MICHAUD BUS LINES
6107 2 COLUMBIA STATION	U OF MASS	7150	6077	HUDSON BUS LINES
6108 2 AIRPORT STATION	LOGAN AIRPORT LOOP	1805	6805	MASSPORT
6109 2 HULL	HINGHAM	5342	5495	HUDSON BUS LINES
6110 2 FRAMINGHAM	TEMPLE ST	2310	6782	WELLESLEY FELLS
6111 1 FRAMINGHAM	SAXONVILLE	2310	6451	WELLESLEY FELLS
6112 2 SAXONVILLE	FRAMINGHAM	6451	2310	WELLESLEY FELLS
6113 1 SAXONVILLE	FRAMINGHAM	6451	2310	WELLESLEY FELLS
6114 1 FRAMINGHAM	MANSION INN	2310	6656	WELLESLEY FELLS
6115 1 MANSION	FRAMINGHAM	6656	2310	WELLESLEY FELLS
6116 2 FRAMINGHAM	NOBSCOT	2310	6685	WELLESLEY FELLS

CTPS.QNET80.TABLE.SUMMARY.MODE7 CTPS NUMBER SORTED

7 1 1	QUEENSBURY	BOYL & FAIRFIELD	5671	5202	55
7 2 1	BOYL & FAIRFIELD	QUEENSBURY	5202	5671	55
7 3 1	COPLEY	E CONCORD ST	1883	5307	68
7 4 1	E CONCORD ST	COPLEY	5307	1883	68
7 5 1	NORTHAMPTON	KNEELAND ST	1826	1824	49-3
7 6 1	KNEELAND ST	NORTHAMPTON	1824	1826	49-3
7 7 1	EGLESTON	STUART ST	1828	1846	43-1
7 8 1	STUART ST	EGLESTON	1846	1828	43-1
7 9 1	SOUTH STATION	NORTH STATION	1848	5338	02
7 10 1	NORTH STATION	SOUTH STATION	5338	1848	02
7 11 2	HARVARD	DUDLEY	1863	1827	01
7 12 1	CITY PT	COPLEY	5645	1883	09
7 13 1	COPLEY	CITY PT	1883	5645	09
7 14 1	CITY PT	KNEELAND	5644	5322	11
7 15 1	KNEELAND	CITY PT	5322	5644	11
7 16 1	ARMY BASE	HAYMARKET	5866	1821	06
7 17 1	HAYMARKET	ARMY BASE	1821	5866	06
7 18 2	CITY POINT	SOUTH STATION	1848	5645	07
7 19 2	COLUMBIA POINT	DUDLEY	6077	1827	08
7 20 2	CITY PT	DUDLEY	5645	1827	10
7 21 1	CENTRAL SQ	CITY HOSP	1864	5307	47
7 22 1	CITY HOSP	CENTRAL SQ	5307	1864	47
7 23 2	WOOD ISLE PARK	MAVERICK	1804	1806	121
7 24 2	ORIENT HEIGHTS	MAVERICK	5214	5224	120
7 25 2	WONDLN	MAVERICK VIA BEACH	6079	1811	117
7 26 2	WONDERLAND	MAVERICK VIA REVERE	1804	1811	116
7 27 2	EVERETT SQ	MAVERICK	1804	1838	112
7 28 1	BEACHMONT	CITY HALL REVERE	2590	5725	119
7 29 1	CITY HALL REVERE	BEACHMONT	5725	2590	119
7 30 2	WONDERLAND	WELLINGTON	1811	1837	110
7 31 2	CNTL SQ	WINTHROP HGL	5714	2202	410
7 32 2	LINDEN	REVERE BEACH	2487	1811	411
7 33 1	HAYMARKET	WOODLAND	1821	5295	111
7 34 1	WOODLAWN	HAYMARKET	5295	1821	111
7 35 2	MALDEN SQ	SULLIVAN	1836	1838	104
7 36 2	MALDEN VIA FAULKNER	SULLIVAN	1836	1838	105
7 37 2	LINDEN VIA BROADWAY	SULLIVAN	1836	2487	109
7 38 2	WELLINGTON	UPPER HIGHLD	1837	2607	99-7
7 39 2	WELLINGTON	LEBANON MLD	1837	5531	106-1,2
7 40 1	WELLINGTON	LINDEN SQ	1837	2487	108
7 41 1	LINDEN SQ	WELLINGTON	2487	1837	108
7 42 2	BROADWAY NORTH	MALDEN STATION	2603	1838	107
7 43 2	MALDEN	WELLINGTON	1838	1836	97-4
7 44 2	ELM ST	WELLINGTON	1837	5740	100
7 45 2	SAUGUS	MALDEN SQ	1838	6007	430

7 46 2	CENTRAL	SQUARE	LYNN	OAKLAND	5540	2202	428
7 47 2	CENTRAL	SQUARE	LYNN	BREED SQ	2202	5569	431
7 48 2	CENTRAL	SQUARE	LYNN	PINE HILL	5551	2202	433
7 49 2	CENTRAL	SQUARE	LYNN	FAYES AVE	6065	2202	456
7 50 2	CENTRAL	SQUARE	LYNN	LAKESIDE	5554	2202	437
7 51 2	CLEVELAND	CIRCLE		ARBORWAY	5686	1953	51
7 52 2	ASHMONT			FOREST HILLS	1830	1855	21
7 53 2	CLEARY	SQ		ARBORWAY	2336	1953	32
7 54 2	MATTAPAN	SQ		ROSLINDALE SQUARE	5415	1862	30
7 55 2	GEORGETOWNE			ARBORWAY	7158	1953	40
7 56 2	SEAVIER	ST LOOP		DUDLEY	1827	5612	44
7 57 2	FRANKLIN	PARK		DUDLEY	1827	5439	45-1
7 58 2	FRANKLIN	PARK		ANDREW	1828	1850	16
7 59 2	EGLESTON			DUDLEY	1827	1828	42
7 60 2	KANE	SQ		DUDLEY	1827	5631	15
7 61 2	MATTAPAN			EGLESTON	1828	1862	29
7 62 2	MATTAPAN			ARBORWAY	1953	1862	28
7 63 2	WOLCOTT	SQ		MATTAPAN	2377	1862	31
7 64 2	HEATH & SOUTH	HUNT		DUDLEY	1827	5661	46
7 65 2	CENTER &	ELLIOTT		DUDLEY	1827	5615	41
7 66 2	ALLSTON			DUDLEY	1827	5679	66
7 67 2	FIELDS	CORNER		DUDLEY	1827	1853	19
7 68 2	ASHMONT			DUDLEY VIA WASHINGTON	1827	1855	23
7 69 2	ASHMONT			DUDLEY VIA TALBOT	1827	1855	22
7 70 2	ASHMONT			ANDREW	1850	1855	18
7 71 2	FIELD	CORNER		ANDREW	1850	1853	17
7 72 2	GALLIVAN	BLVD		ASHMONT	1855	5425	25
7 73 2	MATTAPAN			ASHMONT	1855	1862	27
7 74 1	NORFOLK	ST		ASHMONT STA	5425	1855	26
7 76 1	STATE	HOSPITAL		DUDLEY STA	5427	1827	48-1
7 77 2	MATTAPAN			DEDHAM LINE	1862	6043	33-6
7 78 1	WAKEFIELD			MATTAPAN	5405	1862	24
7 79 1	CLEARY	SQUARE		ARBORWAY	2336	1953	50
7 80 1	ARLINGTON			LECHMERE	5466	1829	38
7 81 1	CHESTNUT	HILL		FOREST HILL	5496	1830	59-4
7 82 2	CHESTNUT	HILL		KENMORE STATION	5496	1921	60
7 83 1	SAVIN	HILL		NORTHAMPTON	1852	1826	13-1
7 84 2	DEDHAM	LINE		ARBORWAY	5401	1953	34
7 85 2	STIMSON &	WASHINGTON		ARBORWAY	5461	1953	35
7 86 2	CHARLES	RIVER	PLAZA	ARBORWAY	5458	1953	36
7 87 1	BAKER	VIA	VERMONT	ARBORWAY	5480	1953	37
7 88 2	WATERTOWN			KENMORE	5831	1921	57
7 89 2	QUINCY	CTR		NO QUINCY BILLINGS RD	1866	1868	212-2
7 90 2	QUINCY	CTR		GERMANTOWN	1868	5503	214-1
7 91 2	BOSTON	COLLEGE		BLANDFORD ST	1895	1921	58
7 92 2	BRIGHTON	CTR		KENMORE	5688	1921	65
7 93 1	GRANITE	ST		CENTRAL CAMP	5242	1864	67
7 94 2	QUINCY	CTR		ASHMONT-W-QUINCY	1868	1855	215-1
7 95 2	QUINCY			HOUGH NECK	1868	5502	216
7 96 2	QUINCY	CTR		HINGHAM	1868	5342	220

7 97 2 QUINCY CTR	FORT POINT	1868	5346	221
7 98 2 QUINCY CTR	EAST WEYMOUTH	1868	5350	222
7 99 1 QUINCY CTR	EAST BRAINTREE	1868	5357	228
7100 2 QUINCY CTR	NO QUINCYSTA	1866	1868	210-2
7101 2 QUINCY CTR	SQUANTUM MONTCLAIR	6105	1868	211
7102 2 ASHMONT STA	WOLLASTON BEACH	1855	5362	217-1
7103 1 ASHMONT STA	NORFOLK ST	1855	5425	26
7104 1 EAST BRAINTREE	QUINCY CTR	5357	1868	228
7105 2 ARBORWAY	EAST WALPOLE	1953	6129	34-6
7107 1 DUDLEY STATION	STATE HOSPITAL	1827	5427	48-1
7108 1 MATTAPAN	WAKEFIELD	1862	5405	24
7109 1 GREEN ST STA	WREN ST	1829	5466	38
7110 1 FOREST HILL	CHESTNUT HILL	1830	5496	59-4
7111 1 NORTHAMPTON	SAVIN HILL	1826	1852	13-1
7112 1 ARBORWAY	BAKER VIA VERNONT	1953	5480	37
7113 1 CENTRAL SQ	GRANITE ST	1864	5242	67
7114 2 QUINCY CENTER	RANDOLPH	1868	1870	230
7115 1 QUINCY CTR	HOLBROOK	1868	5395	230-3
7116 1 QUINCY CTR	WEYMOUTH DES MOINES	1868	5355	225-1
7117 1 WEYMOUTH	QUINCY DES MOINES	5355	1868	225-1
7118 1 QUINCY CTR	WEYMOUTH LANDING	1868	5354	225
7119 1 WEYMOUTH	QUINCY CTR	5892	1868	225
7120 2 QUINCY CTR	SOUTH SHORE PLAZA	1868	5359	237
7121 2 QUINCY CTR	CRAWFORD SQ	1868	1855	238
7122 2 ASHMONT	CRAWFORD SQ	1855	5505	240
7123 2 QUINCY CTR	FIELD CORNER	1855	2658	210-3
7123 2 ASHMONT	AVON CENTER	1855	2658	240-1
7124 2 QUINCY VIA E MILTON	MATTAPAN	1862	1868	245-4
7125 2 QUINCY CENTER	FIELDS CORNER	1868	1853	210-1
7126 2 CYPRESS & HIGH	KENMORE	1921	5665	60-1
7127 2 CHESTNUT HILL	KENMORE	5496	1921	60-5
7128 2 EGLESTON	ANDREW	1830	6077	16-1
7132 2 MALDEN STA	SULLIVAN STA	1838	1836	101-3
7134 2 WOODLAND	WELLINGTON	1837	5295	110-2
7135 2 FREEPORT & MILLS	FIELDS CORNER	1853	5448	14
7136 1 ASHMONT	E-MILTON SQ	1855	5378	246
7137 1 E-MILTON	ASHMONT	5378	1855	246
7138 2 CENTRAL SQUARE LYNN	NAHANT	2202	5915	439
7140 2 SALEM	DANVERS STATE HOSP	2204	6125	468-4
7143 1 FIELDS CORNER LOOP	VIA ADAMS OUTBOUND	1853	5443	20-1,6
7144 1 FIELDS CORNER LOOP	VIA ADAMS INBOUND	5443	1853	20-1,6
7145 1 FIELDS CORNER LOOP	VIA ADAMS & HALLET O	1853	5443	20-2
7146 1 FIELDS CORNER LOOP	VIA ADAMS & HALLET I	5443	1853	20-2
7147 1 FIELDS CORNER	NEPONSET & ADAMS	1853	5443	20-7
7148 1 NEPONSET & ADAMS	FIELDS CORNER LOOP	5443	1853	20-7
7151 2 CENTRAL SQUARE LYNN	HAPPY VALLEY	2202	5556	436
7152 2 CENTRAL SQUARE LYNN	NO SAUGUS	5539	2202	429
7153 2 CENTRAL SQUARE LYNN	HOLYOKE	5547	2202	432
7154 2 MALDEN	WOBURN	1838	2252	133
7155 2 MELROSE EAST	MALDEN	1838	5526	131

7156 1 WYOMING SQ	MELROSE EAST	5530	5529	130
7157 1 MELROSE EAST	WOYOMING SQ	5529	5530	130
7158 2 MALDEN	WAKEFIELD	1838	5524	135
7159 2 MALDEN	WILMINGTON	1838	2241	136
7160 2 MALDEN	READING LINE	1838	6014	137
7161 2 WELLINGTON	WOBURN	1837	5537	134
7162 2 WELLINGTON	WINTHROP ST	1837	5746	134-6
7163 2 SULLIVAN	SALEM ST	5743	1836	101
7164 2 SULLIVAN	W-MEDFORD	5746	1836	95
7165 2 SULLIVAN	HAYMARKET MA	1836	1821	92
7166 2 SULLIVAN	HAYMARKET VIA BUNKER	1836	1821	93
7167 2 SULLIVAN	CLAREDON HILL	2620	1836	89
7168 2 ARLINGTON CTR	LECHMERE	5855	1875	80
7169 2 DAVIS SQ	SULLIVAN HIGHLAND	5259	1836	90
7170 2 DAVIS SQ	SULLIVAN SQ	5259	1836	94
7171 2 CLAREDON HILL	LECHMERE HIGHLAND	2620	1875	88
7172 2 CLAREDON HILL	LECHMERE SOMERVILLE	2620	1875	87
7173 2 SPRING HILL	KENDALL	5257	1865	85
7174 2 SULLIVAN	CENTRAL SQ	1864	1836	91
7175 2 CENTRAL SQCA	RINDGE AVE	1864	5262	83
7176 2 KENDALL	HARVARD BROADWAY	1863	1865	75
7177 2 HARVARD	LECHMERE	1863	1875	69
7178 1 CENTRAL SQ CAMB	OAK SQ	1864	5693	64
7179 1 OAK SQ	CENTRAL SQ	5693	1864	64
7180 1 CENTRAL SQ CAMBRIDGE	WATERTOWN	1864	5831	70
7181 1 WATERTOWNN	CENTRAL SQ CAMBRIDGE	5831	1864	70
7182 1 CENTRAL SQ CAMB	CLEVELAND CIRCLE	1864	1910	63
7183 1 CLEVELAND CIRCLE	CENTRAL SQ CAMB	1910	1864	63
7184 2 UNION SQ SOM	SOMRVL/ALLSTON	5237	5679	86
7185 2 HARVARD	WAVERLEY	2621	2773	73
7186 2 HARVARD	WATERTOWN	1863	5631	71-3
7187 2 HARVARD	HURON AVE	5250	1863	72
7188 2 HARVARD	BELMONT CENTER	1863	6054	74
7189 1 HARVARD	PARK CIRCLE	1863	5845	78
7190 1 PARK CIRCLE	HARVARD	5845	1865	78
7191 1 HARVARD	ARLMONT	1863	5846	84
7192 1 ARLMONT	HARVARD	2516	1863	84
7193 2 ARLINGTON HT	HARVARD	1863	5847	77
7194 1 HARVARD	MEDFORD SQ	1863	5744	96
7195 1 MEDFORD SQ	HARVARD	5744	1863	96
7196 2 ARLINGTON CTR	LECHMERE SOMERVILLE	5855	1875	87-2
7197 1 CENTRAL SQCA	WALTHAM WATT	1864	6002	523-3
7198 1 WALTHAM WATT	CENTRAL SQCA	6002	1864	523-3
7199 2 AUBURNDALE	NEWTON CNR	5435	2648	527-1
7200 2 ROBERTS	NEWTON CNR	2275	2648	520
7201 2 NEWTON CNR	WAVERLY	2773	2648	521
7202 2 ARLINGTON	BEDFORD HSPL	6025	5847	529
7203 2 ARLMONT	HANSCOM BASE	6023	2516	528
7204 2 FIVE FORKS	ARLINGTON CT	6022	5855	530-5
7205 1 WALTHAM	LEXINGTON	2274	2269	525-1

7206 1 LEXINGTON	WALTHAM	2269	2274	525-1
7207 1 WALTHAM	NEWTON CNR	6006	2648	522-2
7208 1 NEWTON CNR	WALTHAM	5822	6006	522-2
7209 2 NEEDHAM	WATERTOWN	5831	2326	532
7210 1 WATERTOWN SQ	CHARLES RVR	1848	5866	533
7211 1 CHARLES RVR	WATERTOWN	5458	5831	533
7212 2 FRAMINGHAM	NEWTON CNR	2648	2310	531
7213 2 CENTRAL SQUARE LYNN	LAKSHORE PARK	2202	2470	435
7214 2 CENTRAL SQUARE LYNN	LIBERTY TREE	2202	5907	435-1
7215 2 SALEM CTR	DANVERS SQ	2204	5906	458-4
7217 2 SALEM CTR	SALEM WILLOW	2204	5587	453
7216 2 SALEM CTR	NO BEVERLY	2204	6102	451
7218 2 CENTRAL SQUARE LYNN	SALEM LORING	2204	2202	455
7219 2 SALEM CTR	MARBLEHEAD	2204	5911	454
7220 2 SALEM CTR	SALEM COLLE	2204	6059	461
7221 2 SALEM CTR	OAKLAND ST	5580	2204	457
7222 2 CENTRAL SQUARE LYNN	MARBLEHEAD PARADISE	2202	5911	441
7223 2 CENTRAL SQUARE LYNN	MARBLEHEAD HUMPHREY	2202	5911	442
7224 2 CENTRAL SQUARE LYNN	SWAMPSCOTT	2202	5573	444-2
7225 2 LINDEN SQ	WINTHROP HIG	2487	5714	412
7226 1 CLIFTONDALE	CENTRAL SQ LYNN	6066	2202	426-C
7227 1 CTRAL SQ LYNN	CLIFTONDALE	2202	6066	426-C
7228 2 BRAINTREE EXTENSION		5393	1869	999-1
7229 2 BRAINTREE EXTENSION		1870	5506	997-2
7230 1 BRAINTREE EXTENSION		5390	1868	996-3
7231 1 BRAINTREE EXTENSION		1868	5390	995-3
7232 2 BRAINTREE EXTENSION		1868	5395	994-4
7233 2 BRAINTREE EXTENSION		1870	5393	993-5
7234 2 BRAINTREE EXTENSION		5389	1868	992-6
7235 2 WAVERLEY	NEWTON CORNER WARREN	2273	5805	521-WAR
7236 1 LAKE SHORE PARK	CENTRAL SQ LYNN	2470	2202	435

CTPS.QNET80.TABLE.SUMMARY.MODE7 MBTA NUMBER SORTED

7 11 2 HARVARD	DUDLEY	1863	1827	01
7 9 1 SOUTH STATION	NORTH STATION	1848	5338	02
7 10 1 NORTH STATION	SOUTH STATION	5338	1848	02
7 16 1 ARMY BASE	HAYMARKET	5866	1821	06
7 17 1 HAYMARKET	ARMY BASE	1821	5866	06
7 18 2 CITY POINT	SOUTH STATION	1848	5645	07
7 19 2 COLUMBIA POINT	DUDLEY	6077	1827	08
7 12 1 CITY PT	COPLEY	5645	1883	09
7 13 1 COPLEY	CITY PT	1883	5645	09
7 20 2 CITY PT	DUDLEY	5645	1827	10
7 14 1 CITY PT	KNEELAND	5644	5322	11
7 15 1 KNEELAND	CITY PT	5322	5644	11
7 83 1 SAVIN HILL	NORTHAMPTON	1852	1826	13-1
7111 1 NORTHAMPTON	SAVIN HILL	1826	1852	13-1
7135 2 FREEPORT & MILLS	FIELDS CORNER	1853	5448	14
7 60 2 KANE SQ	DUDLEY	1827	5631	15
7 58 2 FRANKLIN PARK	ANDREW	1828	1850	16
7128 2 EGLESTON	ANDREW	1830	6077	16-1
7 71 2 FIELD CORNER	ANDREW	1850	1853	17
7 70 2 ASHMONT	ANDREW	1850	1855	18
7 67 2 FIELDS CORNER	DUDLEY	1827	1853	19
7143 1 FIELDS CORNER LOOP	VIA ADAMS OUTBOUND	1853	5444	20-1,6
7144 1 FIELDS CORNER LOOP	VIA ADAMS INBOUND	5443	1853	20-1,6
7145 1 FIELDS CORNER LOOP	VIA ADAMS & HALLET O	1853	5443	20-2
7146 1 FIELDS CORNER LOOP	VIA ADAMS & HALLET I	5443	1853	20-2
7147 1 FIELDS CORNER	NEPONSET & ADAMS	1853	5443	20-7
7148 1 NEPONSET & ADAMS	FIELDS CORNER LOOP	5443	1853	20-7
7 52 2 ASHMONT	FOREST HILLS	1830	1855	21
7 69 2 ASHMONT	DUDLEY VIA TALBOT	1827	1855	22
7 68 2 ASHMONT	DUDLEY VIA WASHINGTON	1827	1855	23
7 78 1 WAKEFIELD	MATTAPAN	5405	1862	24
7108 1 MATTAPAN	WAKEFIELD	1862	5405	24
7 72 2 GALLIVAN BLVD	ASHMONT	1855	5425	25
7 74 1 NORFOLK ST	ASHMONT STA	5425	1855	26
7103 1 ASHMONT STA	NORFOLK ST	1855	5425	26
7 73 2 MATTAPAN	ASHMONT	1855	1862	27
7 62 2 MATTAPAN	ARBORWAY	1953	1862	28
7 61 2 MATTAPAN	EGLESTON	1828	1862	29
7 54 2 MATTAPAN SQ	ROSLINDALE SQUARE	5415	1862	30
7 63 2 WOLCOTT SQ	MATTAPAN	2377	1862	31
7 53 2 CLEARY SQ	ARBORWAY	2336	1953	32
7 77 2 MATTAPAN	DEDHAM LINE	1862	6043	33-6
7 84 2 DEDHAM LINE	ARBORWAY	5461	1953	34
7105 2 ARBORWAY	EAST WALPOLE	1953	6129	34-6
7 85 2 STIMSON & WASHINGTON	ARBORWAY	5461	1953	35

7 86 2 CHARLES RIVER PLAZA	ARBORWAY	5458	1953	36
7 87 1 BAKER VIA VERNONT	ARBORWAY	5480	1953	37
7112 1 ARBORWAY	BAKER VIA VERNONT	1953	5480	37
7 80 1 ARLINGTON	LECHMERE	5466	1829	38
7109 1 GREEN ST STA	WREN ST	1829	5466	38
7 55 2 GEORGETOWNE	ARBORWAY	7158	1953	40
7 65 2 CENTER & ELLIOTT	DUDLEY	1827	5615	41
7 59 2 EGLESTON	DUDLEY	1827	1828	42
7 7 1 EGLESTON	STUART ST	1828	1846	43-1
7 8 1 STUART ST	EGLESTON	1846	1828	43-1
7 56 2 SEAVER ST LOOP	DUDLEY	1827	5612	44
7 57 2 FRANKLIN PARK	DUDLEY	1827	5439	45-1
7 64 2 HEATH & SOUTH HUNT	DUDLEY	1827	5661	46
7 21 1 CENTRAL SQ	CITY HOSP	1864	5307	47
7 22 1 CITY HOSP	CENTRAL SQ	5307	1864	47
7 76 1 STATE HOSPITAL	DUDLEY STA	5427	1827	48-1
7107 1 DUDLEY STATION	STATE HOSPITAL	1827	5427	48-1
7 5 1 NORTHAMPTON	KNEELAND ST	1826	1824	49-3
7 6 1 KNEELAND ST	NORTHAMPTON	1824	1826	49-3
7 79 1 CLEARY SQUARE	ARBORWAY	2336	1953	50
7 51 2 CLEVELAND CIRCLE	ARBORWAY	5686	1953	51
7 1 1 QUEENSBURY	BOYL & FAIRFIELD	5671	5202	55
7 2 1 BOYL & FAIRFIELD	QUEENSBURY	5202	5671	55
7 88 2 WATERTOWN	KENMORE	5831	1921	57
7 91 2 BOSTON COLLEGE	BLANDFORD ST	1895	1921	58
7 81 1 CHESTNUT HILL	FOREST HILL	5496	1830	59-4
7110 1 FOREST HILL	CHESTNUT HILL	1830	5496	59-4
7 82 2 CHESTNUT HILL	KENMORE STATION	5496	1921	60
7126 2 CYPRESS & HIGH	KENMORE	1921	5665	60-1
7127 2 CHESTNUT HILL	KENMORE	5496	1921	60-5
7182 1 CENTRAL SQ CAMB	CLEVELAND CIRCLE	1864	1910	63
7183 1 CLEVELAND CIRCLE	CENTRAL SQ CAMB	1910	1864	63
7178 1 CENTRAL SQ CAMB	OAK SQ	1864	5693	64
7179 1 OAK SQ	CENTRAL SQ	5693	1864	64
7 92 2 BRIGHTON CTR	KENMORE	5688	1921	65
7 66 2 ALLSTON	DUDLEY	1827	5679	66
7 93 1 GRANITE ST	CENTRAL CAMP	5242	1864	67
7113 1 CENTRAL SQ	GRANITE ST	1864	5242	67
7 3 1 COPLEY	E CONCORD ST	1883	5307	68
7 4 1 E CONCORD ST	COPLEY	5307	1883	68
7177 2 HARVARD	LECHMERE	1863	1875	69
7180 1 CENTRAL SQ CAMBRIDGE	WATERTOWN	1864	5831	70
7181 1 WATERTOWNN	CENTRAL SQ CAMBRIDGE	5831	1864	70
7186 2 HARVARD	WATERTOWN	1863	5831	71-3
7187 2 HARVARD	HURON AVE	5250	1863	72
7185 2 HARVARD	WAVERLEY	2621	2773	73
7188 2 HARVARD	BELMONT CENTER	1863	6054	74
7176 2 KENDALL	HARVARD BROADWAY	1863	1865	75
7193 2 ARLINGTON HT	HARVARD	1863	5847	77
7189 1 HARVARD	PARK CIRCLE	1863	5845	78

7190 1 PARK CIRCLE	HARVARD	5845	1863	78
7168 2 ARLINGTON CTR	LECHMERE	5855	1875	80
7175 2 CENTRAL SQCA	RINDGE AVE	1864	5262	83
7191 1 HARVARD	ARLMONT	1863	5846	84
7192 1 ARLMONT	HARVARD	2516	1863	84
7173 2 SPRING HILL	KENDALL	5257	1865	85
7184 2 UNION SQ SOM	SOMRVL/ALLSTON	5237	5679	86
7172 2 CLAREDON HILL	LECHMERE SOMMERVILLE	2620	1875	87
7196 2 ARLINGTON CTR	LECHMERE SOMERVILLE	5855	1875	87-2
7171 2 CLAREDON HILL	LECHMERE HIGHLAND	2620	1875	88
7167 2 SULLIVAN	CLAREDON HILL	2620	1836	89
7169 2 DAVIS SQ	SULLIVAN HIGHLAND	5259	1836	90
7174 2 SULLIVAN	CENTRAL SQ	1864	1836	91
7165 2 SULLIVAN	HAYMARKET MA	1836	1821	92
7166 2 SULLIVAN	HAYMARKET VIA BUNKER	1836	1821	93
7170 2 DAVIS SQ	SULLIVAN SQ	5259	1836	94
7164 2 SULLIVAN	W-MEDFORD	5746	1836	95
7194 1 HARVARD	MEDFORD SQ	1863	5744	96
7195 1 MEDFORD SQ	HARVARD	5744	1863	96
7 43 2 MALDEN	WELLINGTON	1838	1836	97-4
7 38 2 WELLINGTON	UPPER HIGHLD	1837	2607	99-7
7 44 2 ELM ST	WELLINGTON	1837	5740	100
7163 2 SULLIVAN	SALEM ST	5743	1836	101
7132 2 MALDEN STA	SULLIVAN STA	1838	1836	101-3
7 35 2 MALDEN SQ	SULLIVAN	1836	1838	104
7 36 2 MALDEN VIA FAULKNER	SULLIVAN	1836	1838	105
7 39 2 WELLINGTON	LEBANON MULD	1837	5531	106-1,2
7 42 2 BROADWAY NORTH	MALDEN STATION	2603	1838	107
7 40 1 WELLINGTON	LINDEN SQ	1837	2487	108
7 41 1 LINDEN SQ	WELLINGTON	2487	1837	108
7 37 2 LINDEN VIA BROADWAY	SULLIVAN	1836	2487	109
7 30 2 WONDERLAND	WELLINGTON	1811	1837	110
7134 2 WOODLAND	WELLINGTON	1837	5295	110-2
7 33 1 HAYMARKET	WOODLAND	1821	5295	111
7 34 1 WOODLAWN	HAYMARKET	5295	1821	111
7 27 2 EVERETT SQ	MAVERICK	1804	1838	112
7 26 2 WONDLND	MAVERICK VIA REVERE	1804	1811	116
7 25 2 WONDLND	MAVERICK VIA BEACH	1804	1811	117
7 28 1 BEACHMONT	CITY HALL REVERE	2590	5725	119
7 29 1 CITY HALL REVERE	BEACHMONT	5725	2590	119
7 24 2 ORIENT HEIGHTS	MAVERICK	5214	5224	120
7 23 2 WOOD ISLE PARK	MAVERICK	1804	1806	121
7156 1 WYOMING SQ	MELROSE EAST	5530	5529	130
7157 1 MELROSE EAST	WYOMING SQUARE	5529	5530	130
7155 2 MELROSE EAST	MALDEN	1838	5526	131
7154 2 MALDEN	WOBURN	1838	2252	133
7161 2 WELLINGTON	WOBURN	1837	5537	134
7162 2 WELLINGTON	WINTHROP ST	1837	5746	134-6
7158 2 MALDEN	WAKEFIELD	1838	5524	135
7159 2 MALDEN	WILMINGTON	1838	2241	136

7160 2 MALDEN	READING LINE	1838	6014	137
7125 2 QUINCY CENTER	FIELDS CORNER	1853	1868	210-1
7100 2 QUINCY CTR	NO QUINCYSTA	1866	1868	210-2
7101 2 QUINCY CTR	SQUANTUM MONTCLAIR	6105	1868	211
7 89 2 QUINCY CTR	NO QUINCY BILLINGS RD	1866	1868	212-2
7 90 2 QUINCY CTR	GERMANTOWN	1868	5503	214-1
7 94 2 QUINCY CTR	ASHMONT-W-QUINCY	1868	1855	215-1
7 95 2 QUINCY	HOUGH NECK	1868	5502	216
7102 2 ASHMONT STA	WOLLASTON BEACH	1855	5362	217-1
7 96 2 QUINCY CTR	HINGHAM	1868	5342	220
7 97 2 QUINCY CTR	FORT POINT	1868	5346	221
7 98 2 QUINCY CTR	EAST WEYMOUTH	1868	5350	222
7118 1 QUINCY CTR	WEYMOUTH LANDING	1868	5354	225
7119 1 WEYMOUTH	QUINCY CTR	5892	1868	225
7116 1 QUINCY CTR	WEYMOUTH DES MOINES	1868	5355	225-1
7117 1 WEYMOUTH	QUINCY DES MOINES	5355	1868	225-1
7 99 1 QUINCY CTR	EAST BRAINTREE	1868	5357	228
7104 1 EAST BRAINTREE	QUINCY CTR	5357	1868	228
7114 2 QUINCY CENTER	RANDOLPH	1868	1870	230
7115 1 QUINCY CTR	HOLBROOK	1868	5395	230-3
7120 2 QUINCY CTR	SOUTH SHORE PLAZA	1868	5389	237
7121 2 QUINCY CTR	CRAWFORD SQ	1868	1855	238
7122 2 ASHMONT	CRAWFORD SQ	1855	5505	240
7123 2 ASHMONT	AVON CENTER	1855	2658	240-1
7124 2 QUINCY VIA E MILTON	MATTAPAN	1862	1868	245-4
7136 1 ASHMONT	E-MILTON SQ	1855	5378	246
7137 1 E-MILTON	ASHMONT	5378	1855	246
7 31 2 CNTL SQ	WINTHROP HGL	5714	2202	410
7 32 2 LINDEN	REVERE BEACH	2487	1811	411
7225 2 LINDEN SQ	WINTHROP HIG	2487	5714	412
7226 1 CLIFTONDALE	CENTRAL SQ LYNN	6066	2202	426-C
7227 1 CTRAL SQ LYNN	CLIFTONDALE	2202	6066	426-C
7 46 2 CENTRAL SQUARE LYNN	OAKLAND	5540	2202	428
7152 2 CENTRAL SQUARE LYNN	NO SAUGUS	5539	2202	429
7 45 2 SAUGUS	MALDEN SQ	1838	6007	430
7 47 2 CENTRAL SQUARE LYNN	BREED SQ	2202	5569	431
7153 2 CENTRAL SQUARE LYNN	HOLYOKE	5547	2202	432
7 48 2 CENTRAL SQUARE LYNN	PINE HILL	5551	2202	433
7213 2 CENTRAL SQUARE LYNN	LAKSHORE PARK	2202	2470	435
7236 1 LAKE SHORE PARK	CENTRAL SQ LYNN	2470	2202	435
7214 2 CENTRAL SQUARE LYNN	LIBERTY TREE	2202	5907	435-1
7151 2 CENTRAL SQUARE LYNN	HAPPY VALLEY	2202	5556	436
7 50 2 CENTRAL SQUARE LYNN	LAKESIDE	5554	2202	437
7138 2 CENTRAL SQUARE LYNN	NAHANT	2202	5915	439
7222 2 CENTRAL SQUARE LYNN	MARBLEHEAD PARADISE	5911	6838	441
7223 2 CENTRAL SQUARE LYNN	MARBLEHEAD HUMPHREY	5911	6838	442
7224 2 CENTRAL SQUARE LYNN	SWAMPSCOTT	2202	5573	444-2
7216 2 SALEM CTR	NO BEVERLY	2204	6102	451
7217 2 SALEM CTR	SALEM WILLOW	2204	5587	453
7219 2 SALEM CTR	MARBLEHEAD	2204	5911	454

7218 2 CENTRAL SQUARE LYNN	SALEM LORING	2204	2202	455
7 49 2 CENTRAL SQUARE LYNN	FAYES AVE	6065	2202	456
7221 2 SALEM CTR	OAKLAND ST	5580	2204	457
7215 2 SALEM CTR	DANVERS SQ	2204	5906	458-4
7220 2 SALEM CTR	SALEM COLLE	2204	6168	461
7140 2 SALEM	DANVERS STATE HOSP	2204	6125	468-4
7200 2 ROBERTS	NEWTON CNR	2275	2648	520
7201 2 NEWTON CNR	WAVERLY	2773	5805	521
7235 2 WAVERLEY	NEWTON CORNER WARREN	2273	5805	521-WAR
7207 1 WALTHAM	NEWTON CNR	6006	2648	522-2
7208 1 NEWTON CNR	WALTHAM	5805	6006	522-2
7197 1 CENTRAL SQCA	WALTHAM WATT	1864	6002	523-3
7198 1 WALTHAM WATT	CENTRAL SQCA	6002	1864	523-3
7205 1 WALTHAM	LEXINGTON	2274	2269	525-1
7206 1 LEXINGTON	WALTHAM	2269	2274	525-1
7199 2 AUBURNDALE	NEWTON CNR	5435	2648	527-1
7203 2 ARLMONT	HANSCOM BASE	6023	2516	528
7202 2 ARLINGTON	BEDFORD HSPL	6025	5847	529
7204 2 FIVE FORKS	ARLINGTON CT	6022	5855	530-5
7212 2 FRAMINGHAM	NEWTON CNR	2648	2310	531
7209 2 NEEDHAM	WATERTOWN	5831	2326	532
7210 1 WATERTOWN SQ	CHARLES RVR	1848	5866	533
7211 1 CHARLES RVR	WATERTOWN	5458	5831	533
7234 2 BRAINTREE EXTENSION		5389	1868	992-6
7233 2 BRAINTREE EXTENSION		1870	5393	993-5
7232 2 BRAINTREE EXTENSION		1868	5395	994-4
7231 1 BRAINTREE EXTENSION		1868	5390	995-3
7230 1 BRAINTREE EXTENSION		5390	1868	996-3
7229 2 BRAINTREE EXTENSION		1870	5506	997-2
7228 2 BRAINTREE EXTENSION		5393	1869	999-1

CTPS.QNET80.TABLE.SUMMARY.MODE8*****START

8 1 1 RIVERSIDE	COPLEY	1934	1883	MBTA	303
8 2 1 COPLEY	RIVERSIDE	1883	1934	MBTA	303
8 3 1 RIVERSIDE	SUMMER & CHAUNCY	1934	1847	MBTA	300
8 4 1 SUMMER & CHAUNCY	RIVERSIDE	1847	1934	MBTA	300
8 5 1 WATERTOWN	COPLEY	5831	1883	MBTA	302
8 6 1 COPLEY	WATERTOWN	1883	5831	MBTA	302
8 7 1 WATERTOWN	SUMMER & CHAUNCY	5831	1847	MBTA	304
8 8 1 SUMMER & CHAUNCY	WATERTOWN	1847	5831	MBTA	304
8 9 1 BRIGHTON CENTER	SUMMER & CHAUNCY	5688	1847	MBTA	301
8 10 1 SUMMER & CHAUNCY	BRIGHTON CENTER	1847	5688	MBTA	301
8 11 1 WALTHAM	SUMMER & CHAUNCY	2274	1847	MBTA	305
8 12 1 SUMMER & CHAUNCY	WALTHAM	1847	2274	MBTA	305
8 13 2 ELM ST MEDFORD	HAYMARKET	5740	1821	MBTA	325
8 14 2 W MEDFORD	HAYMARKET	5746	1821	MBTA	326
8 15 1 BURLINGTON	BOSTON PARK SQ	2514	5332	MBTA	700-2
8 16 1 BOSTON PARK SQ	BURLINGTON	5332	2514	MBTA	700-2
8 17 1 BURLINGTON VIA 1-93	BOSTON PARK SQ	2514	5332	MBTA	701-4
8 18 1 BOSTON PARK SQ	BURLINGTON VIA 1-93	5332	2514	MBTA	701-4
8 19 1 CENTRAL SQ LYNN	BOSTON VIA CLIFT	2202	1821	MBTA	426
8 20 1 BOSTON VIA CLIFT	CENTRAL SQ LYNN	1821	2202	MBTA	426
8 21 2 SALEM	BOSTON	2204	1821	MBTA	450
8 23 2 CENTRAL SQ LYNN	BOSTON VIA GE BRIDGE	2202	1821	MBTA	440
8 25 2 CENTRAL SQ LYNN	BOSTON VIA WESTERN	2202	1821	MBTA	400
8 29 1 WORCESTER	BOSTON	2578	5323	RITCHIE BUS LINES	
8 30 1 BOSTON	WORCESTER	5323	2578	RITCHIE BUS LINES	
8 31 2 WORCESTER	BOSTON VIA RTE 9	2578	6838	GREYLINE	
8 32 1 FRAMINGHAM	BOSTON VIA RTE 9	6780	5332	GREYLINE	
8 33 1 SHOPPERS WORLD FRAM	BOSTON VIA RTE 9	6785	5332	GREYLINE	
8 34 1 BOSTON	FRAMINGHAM	5332	6780	GREYLINE	
8 35 1 FITCHBURG	BOSTON	2690	6945	ENGLANDER COACH	
8 36 1 BOSTON	FITCHBURG	6945	2690	ENGLANDER COACH	
8 37 1 MILFORD	BOSTON SOUTH STATION	2410	5323	BRUSH HILL TRANS	
8 38 1 BOSTON SOUTH STATION	MILFORD	5323	2410	BRUSH HILL TRANS	
8 39 1 HAVERHILL	BOSTON	6700	6945	BOSTON COMMUTER	
8 40 1 BOSTON	HAVERHILL	6945	6700	BOSTON COMMUTER	
8 41 1 AMESBURY	BOSTON	6717	6945	BOSTON COMMUTER	
8 42 1 BOSTON	AMESBURY	6945	6717	BOSTON COMMUTER	
8 43 1 BEVERLY	BOSTON	6731	5332	HUDSON BUS LINES	
8 44 1 BOSTON	BEVERLY	5332	6731	HUDSON BUS LINES	
8 45 1 BOSTON	PEABODY CENTER	5332	6733	HUDSON BUS LINES	
8 46 1 PEABODY CENTER	BOSTON	6733	5332	HUDSON BUS LINES	
8 47 1 BOSTON	PEABODY RUSSELL PLAZA	5332	6732	HUDSON BUS LINES	
8 48 1 PEABODY RUSSELL PLAZA	BOSTON	6732	5332	HUDSON BUS LINES	
8 50 1 LAWRENCE	BOSTON	6840	5332	TROMBLEY MOTOR	
8 51 1 BOSTON	LAWRENCE	5332	6840	TROMBLEY MOTOR	

8 52 1	LOWELL	BOSTON	6433	5332	TROMBLEY MOTOR
8 53 1	BOSTON	LOWELL	5332	6433	TROMBLEY MOTOR
8 54 1	WHITMAN	ASHMONT	6494	1855	HUDSON BUS LINES
8 55 1	ASHMONT	WHITMAN	1855	6494	HUDSON BUS LINES
8 56 1	SOUTH WEYMOUTH	ASHMONT	6499	1855	HUDSON BUS LINES
8 57 1	COLUMBIA SQ	ASHMONT	6609	1855	HUDSON BUS LINES
8 58 1	ASHMONT	ROCKLAND	1855	6603	HUDSON BUS LINES
8 59 1	BROCKTON	BOSTON	6474	6945	PLYMOUTH & BROCK
8 60 1	BOSTON	BROCKTON	6945	6474	PLYMOUTH & BROCK
8 61 1	DUXBURY KINGSTON	BOSTON	2432	6945	PLYMOUTH & BROCK
8 62 1	BOSTON	DUXBURY KINGSTON	6945	2432	PLYMOUTH & BROCK
8 63 1	DUXBURY	BOSTON	6629	6945	PLYMOUTH & BROCK
8 64 1	BOSTON	DUXBURY	6945	6629	PLYMOUTH & BROCK
8 65 1	MARSHFIELD GR HARBOR	BOSTON	6634	6945	PLYMOUTH & BROCK
8 66 1	BOSTON	MARSHFIELD GR HARBOR	6945	6634	PLYMOUTH & BROCK
8 67 1	PEMBROKE	BOSTON	7171	6945	PLYMOUTH & BROCK
8 68 1	BOSTON	PEMBROKE	6945	7171	PLYMOUTH & BROCK
8 69 1	SCITUATE	BOSTON	6643	6945	PLYMOUTH & BROCK
8 70 1	BOSTON	SCITUATE	6945	6643	PLYMOUTH & BROCK
8 71 1	ANDOVER	BOSTON	2243	5332	TROMBLEY MOTOR CH
8 72 2	(FOXBORO) PROVIDENCE	BOSTON (LOGAN AIRPORT)	6950	6805	BONANZA
8 73 1	BRIDGEWATER	BOSTON	6500	6945	ALMEIDA BUS LINES
8 75 1	PLAINVILLE	BOSTON	6930	6945	A. B. C. INC
8 76 1	BOSTON	PLAINVILLE	6945	6930	A. B. C. INC
8 77 1	STONEHAM	SULLIVAN STATION	6749	1836	HUDSON BUS LINES
8 78 1	SULLIVAN STATION	STONEHAM	1836	6749	HUDSON BUS LINES
8 79 2	RTE128 STA SSPLAZA	HAYMARKET	2335	6838	HUDSON BUS LINES
8 80 1	FACTORY PAINT SO WEY	HAYMARKET	6650	6838	HUDSON BUS LINES
8 81 2	FACTORY PAINT WEY LDG	HAYMARKET	6650	6838	HUDSON BUS LINES
8 82 1	COL SQ SSPLAZA	HAYMARKET	6609	6838	HUDSON BUS LINES
8 83 1	COL SQ WEY LANDING	HAYMARKET	6609	6838	HUDSON BUS LINES
8 84 2	HINGHAM E WEYMOUTH	HAYMARKET	5342	6838	HUDSON BUS LINES
8 85 1	HAYMARKET	COL SQ WEYMOUTH	6838	6609	HUDSON BUS LINES
8 86 1	HAYMARKET	COL SQ FACTORY PAINT	6838	6650	HUDSON BUS LINES
8 87 1	CANTON RTE 138	S. STATION &GREYHOUND	6411	6945	BRUSH HILL BUS
8 88 1	BOSTON	CANTON RTE 138	6945	6411	BRUSH HILL BUS
8 89 1	HAYMARKET	SSPLAZA RTE 128STATION	6838	2355	HUDSON BUS LINES

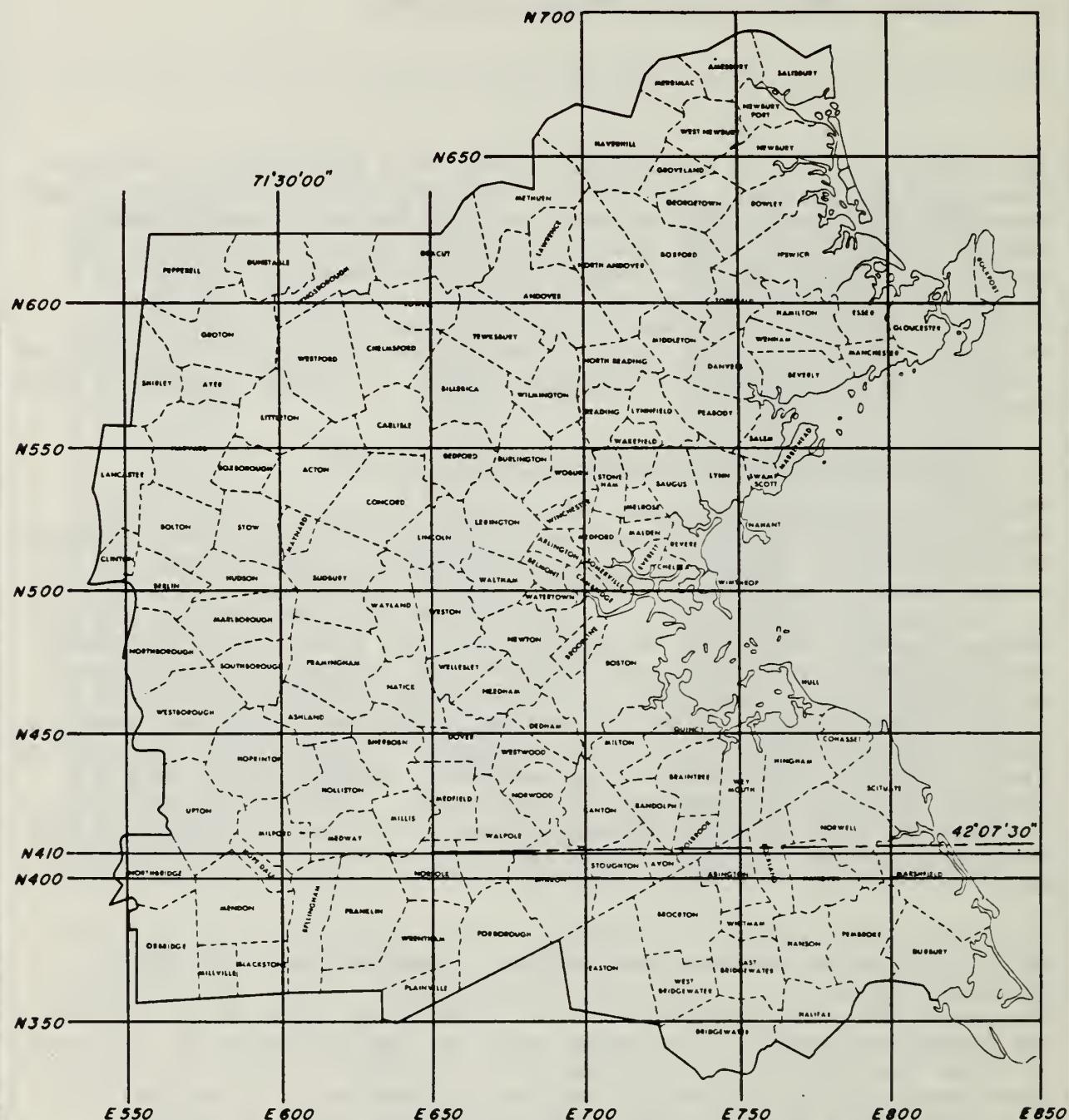
D. TRANSIT NETWORK MAPS DEVELOPED AND USED

Many maps of various scales and forms have been used in connection with the transit inventory. The State Plane Coordinate Map System is the basic system used for the Eastern Massachusetts region. These maps are used as the base maps to determine the coordinates used for the nodes and to determine the general layout of the routes considered in the inventory. The MDPW Official Transportation map shows the location of important shopping centers, parks, etc. The various references are helpful aids in the laying down of routes, stops and other necessary data for the UNET data file.

D.1 MASSACHUSETTS STATE PLANE COORDINATE MAP

This is the base-map system used in the transit study. See Figure D-1. It is also known as the General Highway Map, County Series, and was prepared for the Massachusetts Department of Public Works, Bureau of Transportation Planning and Development, in cooperation with the U.S. Department of Commerce, Bureau of Public Roads. As shown in Figure D-1, the base grid coordinate system used is an orthogonal system with reference axes aligned at a specific latitude and longitude. The grid is spaced at 10,000-foot intervals and is labeled along the longitude axis as E600 (the last three zeros are omitted). This line is aligned on the 71 degree 30'00" longitude meridian, which occurs in the western section of the region under study. The N410, E600 axis is located in the southeastern corner of Milford. Note that the 42 degree 07'30" latitude line bends upwards away from the N410 axis.

Latitude and longitude are shown on the county series maps as solid tic marks and are the Polyconic Projection, 1927 North American Datum, at 7 1/2 minute intervals. Also, the Universal Traverse Mercator Grid Zone 19 at 5000-meter intervals is shown as dashed tic marks. The maps used for the majority of the area outside the CBD are at a scale of 1" = 2000 ft. Within an area near Route 128, a series of maps with a scale of 1" = 1000 ft. was used. For the CBD area, the peninsular area of Boston proper, a map with a scale of 1" = 400 ft. was used. Fourteen map sections were used in laying down the transit routes in the region. They are shown in Figure D-2 as follows:



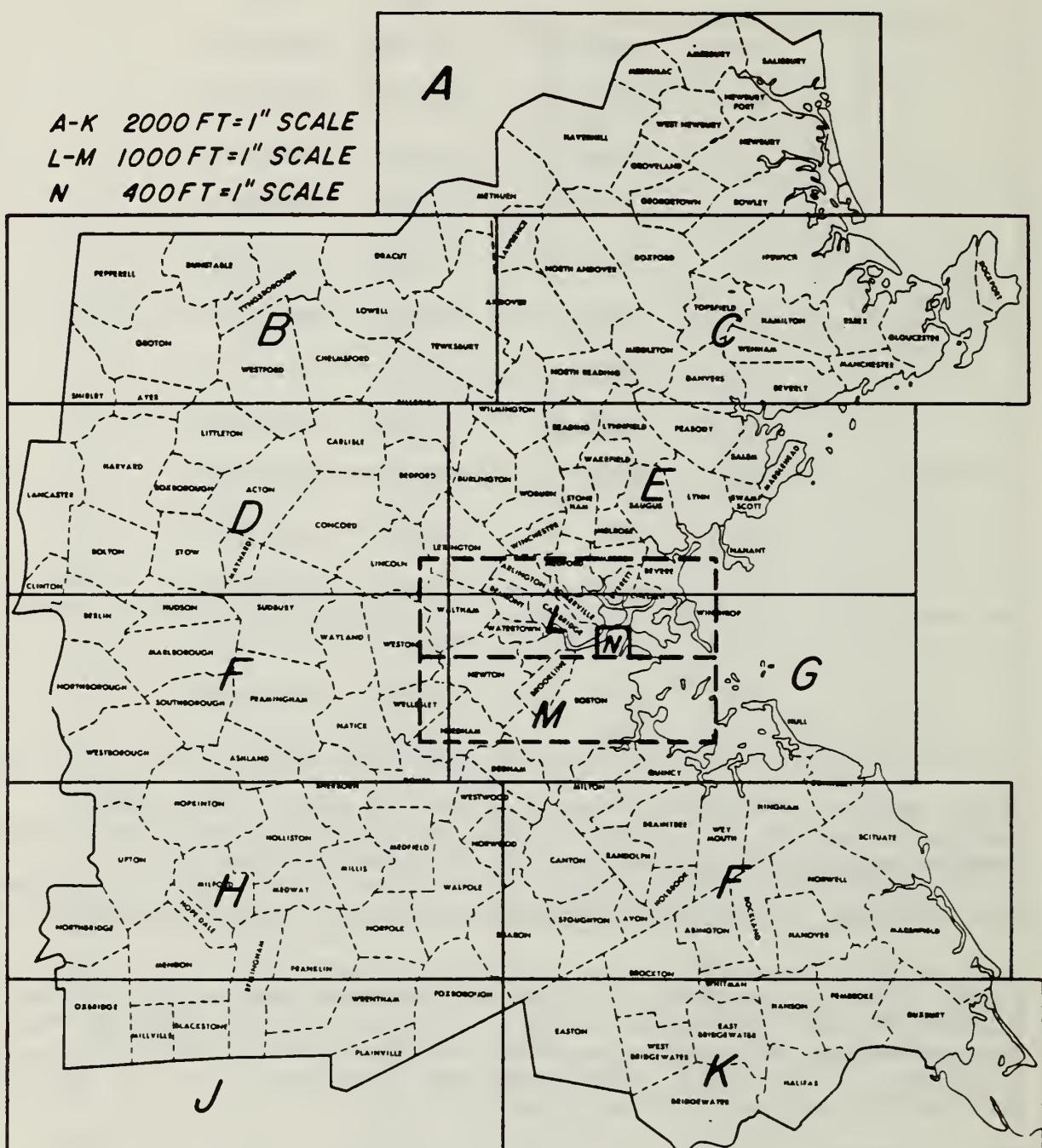
<u>Section</u>	<u>Scale</u>	<u>Region Encompassed</u>	
		<u>N</u>	<u>E</u>
A	2000 ft.	630-690	650-800
B	2000 ft.	570-630	540-685
C	2000 ft.	570-630	685-850
D	2000 ft.	510-570	540-670
E	2000 ft.	510-570	670-800
F	2000 ft.	450-510	540-670
G	2000 ft.	450-510	670-810
H	2000 ft.	390-450	540-685
I	2000 ft.	390-450	685-830
J	2000 ft.	350-390	540-685
K	2000 ft.	330-390	685-840
L	1000 ft.	488-530	660-750
M	1000 ft.	447-490	660-722
N	400 ft.	490-500	715-722

These map sections have been prepared on mylar. The symbols representing the link nomenclature and other symbols and various node representations are shown in Figures D-3 and D-4.

D.2 SUMMARY OF QNET80, TOWN NAME, CTPS NO. AND MAP LOCATION

Tables D-1, D-2, and D-3 may be used to cross-reference town names, CTPS zones, and the transit-inventory maps. For example, BOSTON CBD has CTPS zone numbers 1-60 and may be found on Map N. The three tables have been sorted on (A) CTPS ZONE NUMBER (columns 2, 5, 8), (B) ZONE/TOWN NAME (columns 1, 4, 7), and (C) MAP/LETTER DESIGNATION (columns 3, 6, 9).

A-K 2000 FT=1" SCALE
L-M 1000 FT=1" SCALE
N 400FT=1" SCALE



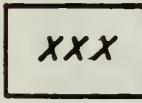
- Walk Mode 1
- Auto Access Mode 2
- Auto Access Mode 3
- Commuter Rail Mode 4
- Rapid Rail Transit Mode 5
- Non-MBTA Bus Mode 6
- MBTA Local Bus Mode 7
- MBTA Express Bus Mode 8



Transit Route Terminus



Intermediate Route Descriptors



Auto Access Connector (zone centroid)



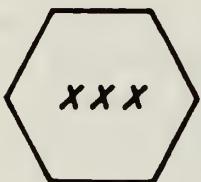
Auto Access Connection (to station number)



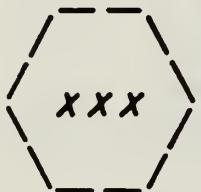
(xxxx) Subsequent Node on Adjacent Map

Note: Mode 6 - Use line numbers from 1 to xxx as local bus route identifiers.

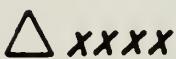
- For express bus, start line numbers from 255 and count down.
- A total of 255 lines are possible.



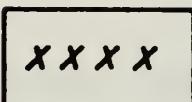
Zone Centroid



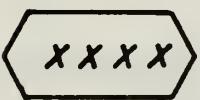
Zone Centroid (Displaced for Clarity)



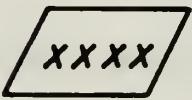
*Town Boundary Node for Bus Lines Only
(See Coordinate Card "4" Columns 41-46
for Town Numbers)*



Rail Rapid Transit Station



Commuter Rail Station



Express Bus Stop



All Other Nodes

CTPS NO	ZONE/TOWN NAME	MAP	CTPS NO	ZONE/TOWN NAME	MAP
001	BOSTON/FINANCIAL-RET	N	*262	268 REVERE	EL *
002	BOSTON/PARK SQUARE	N	*269	279 MEDFORD	L *
003	BOSTON/GOV'T CENTER	N	*280	288 MALDEN	EL *
004 006	BOSTON/FINANCIAL-RET	N	*289	295 EVERETT	L *
007 008	BOSTON/WATERFRONT	N	*296	299 MELROSE	EL *
009 010	BOSTON/GOV'T CENTER	N	*300	302 STONEHAM	E *
011	BOSTON/FINANCIAL-RET	N	*303	307 WINCHESTER	EL *
012	BOSTON/GOV'T CENTER	N	*308	313 WOBURN	EL *
013	BOSTON/FINANCIAL-RET	N	*314	321 BELMONT	L *
014	BOSTON/WATERFRONT	N	*322	328 ARLINGTON	L *
015 019	BOSTON/NORTH END	N	*329	339 WALTHAM	M *
020 022	BOSTON/GOV'T CENTER	N	*340	343 WATERTOWN	G *
023	BOSTON/NORTH END	N	*344	360 NEWTON	G *
024	BOSTON/BEACON HILL	N	*361	NAHANT	G *
025	BOSTON/NORTH END	N	*362	363 SWAMPSCOTT	E *
026 028	BOSTON/BEACON HILL	N	*364	385 LYNN	E *
029 032	BOSTON/BACK BAY	N	*386	389 SAUGUS	EL *
033	BOSTON/PARK SQUARE	N	*390	393 WAKEFIELD	E *
034	BOSTON/SOUTH END	N	*394	395 LYNNFIELD	CE *
035	BOSTON/PRUDENTIAL	N	*396	402 PEABODY	CE *
036	BOSTON/SOUTH END	N	*403	407 DANVERS	CE *
037 043	BOSTON/PRUDENTIAL	N	*408	WENHAM	C *
044 052	BOSTON/SOUTH END	N	*409	BURLINGTON	E *
053 054	BOSTON/PARK SQUARE	N	*410	READING	CE *
055 060	BOSTON/SOUTH END	N	*411	MARBLEHEAD	E *
061 072	BOSTON/EAST BOSTON	N	*412	418 SALEM	E *
073 080	BOSTON/CHARLESTOWN	N	*419	424 BEVERLY	CE *
081 094	BOSTON/SO BOSTON	N	*425	MANCHESTER	C *
095 098	BOSTON/FENWAY-P.HILL	N	*426	429 WELLESLEY	FM *
099 105	BOSTON/ROXBURY	N	*430	431 WESTON	F *
106 109	BOSTON/FENWAY-P.HILL	N	*432	436 NEEDHAM	M *
110	BOSTON/JAMAICA PLAIN	N	*437	439 LEXINGTON	DEL*
111 130	BOSTON/ROXBURY	N	*440	441 DEDHAM	IM *
131 144	BOSTON/NO DORCHESTER	N	*442	443 WESTWOOD	HIM*
145 156	BOSTON/SO DORCHESTER	N	*444	446 CANTON	I *
157 160	BOSTON/MATTAPAN	N	*447	450 MILTON	IM *
161	BOSTON/ROXBURY	N	*451	462 QUINCY	IM *
162	BOSTON/JAMAICA PLAIN	N	*463	465 RANDOLPH	I *
163 167	BOSTON/ROSLINDALE	N	*466	473 BRAINTREE	IM *
168 174	BOSTON/JAMAICA PLAIN	N	*474	479 WEYMOUTH	I *
175 178	BOSTON/WEST ROXBURY	N	*480	ROCKPORT	C *
179 184	BOSTON/HYDE PARK	N	*481	GOLOUCESTER	C *
185 192	BOSTON/ALLSTON-BRHTN	N	*482	ESSEX	C *
193	LOGAN AIRPORT	L	*483	HAMILTON	C *
194 199	CHELSEA	L	*484	IPSWICH	C *
200 229	CAMBRIDGE	L	*485	TOPSFIELD	C *
230 244	SOMERVILLE	L	*486	MIDDLETON	C *
245 256	BROOKLINE	LM	*487	NORTH READING	C *
257 261	WINTHROP	L	*488	WILMINGTON	BCE*

CTPS NO	ZONE/TOWN NAME	MAP	CTPS NO	ZONE/TOWN NAME	MAP
489	BEDFORD	DE	*545	ROWLEY	AC *
490	LINCOLN	D	*546	AMESBURY	A *
491	CARLISLE	D	*547	WEST NEWBURY	A *
492	CONCORD	D	*548	GROVELAND	A *
493	ACTON	D	*549	GEORGETOWN	AC *
494	LITTLETON	BD	*550	BOXFORD	AB *
495	BOXBOROUGH	D	*551	MERRIMAC	A *
496	BOLTON	DF	*552	HAVERHILL	A *
497	STOW	DF	*553	NORTH ANDOVER	AC *
498	MAYNARD	D	*554	METHUEN	AB *
499	SUDSBURY	DF	*555	LAWRENCE	ABC*
500	WAYLAND	DF	*556	ANDOVER	BC *
501	505 FRAMINGHAM	F	*557	DRACUT	AB *
506	HUDSON	DF	*558	TEWKSBURY	BC *
507	MARLBOROUGH	F	*559	LOWELL	B *
508	SOUTHBOROUGH	F	*560	BILLERICA	BD *
509	ASHLAND	F	*561	TYNSBOROUGH	B *
510	513 NATICK	F	*562	CHELMSFORD	BD *
514	SHERBORN	FH	*563	WESTFORD	BD *
515	HOPKINTON	FH	*564	DUNSTABLE	B *
516	HOLLISTON	H	*565	PEPPERELL	B *
517	MILFORD	H	*566	GROTON	B *
518	MEDWAY	H	*567	AYER	BD *
519	MILLIS	H	*568	SHIRLEY	BD *
520	MEDFIELD	H	*569	HARVARD	D *
521	DOVER	FH	*570	LANCASTER	D *
522	NORWOOD	HI	*571	CLINTON	DF *
523	WALPOLE	H	*572	BERLIN	D *
524	NORFOLK	H	*573	NORTHBOROUGH	F *
525	FRANKLIN	HJ	*574	WESTBOROUGH	FH *
526	BELLINGHAM	HJ	*575	UPTON	H *
527	WRENTHAM	HJ	*576	HOPEDALE	H *
528	FOXBOROUGH	HJ	*577	MENDON	HJ *
529	SHARON	IK	*578	NORTHBRIDGE	H *
530	STOUGHTON	I	*579	UXBRIDGE	HJ *
531	HOLBROOK	I	*580	MILLVILLE	J *
532	ROCKLAND	I	*581	BLACKSTONE	J *
533	HULL	M	*582	PLAINVILLE	J *
534	HINGHAM	IM	*583	EASTON	IK *
535	COHASSET	IM	*584	AVON	I *
536	SCITUATE	IM	*585	BROCKTON	IK *
537	NORWELL	I	*586	ABINGTON	I *
538	HANOVER	I	*587	WHITMAN	IK *
539	PEMBROKE	IK	*588	EAST BRIDgewater	K *
540	MARSHFIELD	IK	*589	WEST BRIDgewater	K *
541	DUXBURY	IK	*590	BRIDgewater	K *
542	SALISBURY	A	*591	HANSON	IK *
543	NEWBURYPORT	A	*592	HALIFAX	K *
544	NEWBURY	A	*		

ZONE/TOWN NAME	CTPS NO	MAP	ZONE/TOWN NAME	CTPS NO	MAP
ABINGTON	586	I	*BOSTON/ROXBURY	099	105 N *
ACTON	493	D	*BOSTON/SO BOSTON	081	094 N *
AMESBURY	546	A	*BOSTON/SO DORCHESTER	145	156 N *
ANDOVER	556	BC	*BOSTON/SOUTH END	034	N *
ARLINGTON	322	328 L	*BOSTON/SOUTH END	036	N *
ASHLAND	509	F	*BOSTON/SOUTH END	044	052 N *
AVON	584	I	*BOSTON/SOUTH END	055	060 N *
AYER	567	BD	*BOSTON/WATERFRONT	014	N *
BEDFORD	489	DE	*BOSTON/WATERFRONT	007	008 N *
BELLINGHAM	526	HJ	*BOSTON/WEST ROXBURY	175	178 N *
BELMONT	314	321 L	*BOXBOROUGH	495	D *
BERLIN	572	D	*BOXFORD	550	AB *
BEVERLY	419	424 CE	*BRAINTREE	466	473 IM *
BILLERICA	560	BD	*BRIDGEWATER	590	K *
BLACKSTONE	581	J	*BROCKTON	585	IK *
BOLTON	496	DF	*BROOKLINE	245	256 LM *
BOSTON/ALLSTON-BRHTN	185	192 N	*BURLINGTON	409	E *
BOSTON/BACK BAY	029	032 N	*CAMBRIDGE	200	229 L *
BOSTON/BEACON HILL	026	028 N	*CANTON	444	446 I *
BOSTON/BEACON HILL	024	N	*CARLISLE	491	D *
BOSTON/CHARLESTOWN	073	080 N	*CHELMSFORD	562	BD *
BOSTON/EAST BOSTON	061	072 N	*CHELSEA	194	199 L *
BOSTON/FENWAY-P.HILL	095	098 N	*CLINTON	571	DF *
BOSTON/FENWAY-P.HILL	106	109 N	*COHASSET	535	IM *
BOSTON/FINANCIAL-RET	004	006 N	*CONCORD	492	D *
BOSTON/FINANCIAL-RET	013	N	*DANVERS	403	407 CE *
BOSTON/FINANCIAL-RET	001	N	*DEDHAM	440	441 IM *
BOSTON/FINANCIAL-RET	011	N	*DOVER	521	FH *
BOSTON/GOV'T CENTER	012	N	*DRACUT	557	AB *
BOSTON/GOV'T CENTER	020	022 N	*DUNSTABLE	564	B *
BOSTON/GOV'T CENTER	009	010 N	*DUXBURY	541	IK *
BOSTON/GOV'T CENTER	003	N	*EAST BRIDGEWATER	588	K *
BOSTON/HYDE PARK	179	184 N	*EASTON	583	IK *
BOSTON/JAMAICA PLAIN	110	N	*ESSEX	482	C *
BOSTON/JAMAICA PLAIN	162	N	*EVERETT	289	295 L *
BOSTON/JAMAICA PLAIN	168	174 N	*FOXBOROUGH	528	HJ *
BOSTON/MATTAPAN	157	160 N	*FRAMINGHAM	501	505 F *
BOSTON/NO DORCHESTER	131	144 N	*FRANKLIN	525	HJ *
BOSTON/NORTH END	015	019 N	*GEORGETOWN	549	AC *
BOSTON/NORTH END	023	N	*GLOUCESTER	481	C *
BOSTON/NORTH END	025	N	*GROTON	566	B *
BOSTON/PARK SQUARE	002	N	*GROVELAND	548	A *
BOSTON/PARK SQUARE	033	N	*HALIFAX	592	K *
BOSTON/PARK SQUARE	053	054 N	*HAMILTON	483	C *
BOSTON/PRUDENTIAL	035	N	*HANOVER	538	I *
BOSTON/PRUDENTIAL	037	043 N	*HANSON	591	IK *
BOSTON/ROSLINDALE	163	167 N	*HARVARD	569	D *
BOSTON/ROXBURY	111	130 N	*HAVERHILL	552	A *
BOSTON/ROXBURY	161	N	*HINGHAM	534	IM *

ZONE/TOWN NAME	CTPS NO	MAP	ZONE/TOWN NAME	CTPS NO	MAP	
HOLBROOK	531	I	*PEPPERELL	565	B *	
HOLLISTON	516	H	*PLAINVILLE	582	J *	
HOPEDALE	576	H	*QUINCY	451	462 IM *	
HOPKINTON	515	FH	*RANDOLPH	463	465 I *	
HUDSON	506	DF	*READING	410	CE *	
HULL	533	M	*REVERE	262	268 EL *	
IPSWICH	484	C	*ROCKLAND	532	I *	
LANCASTER	570	D	*ROCKPORT	480	C *	
LAWRENCE	555	ABC	*ROWLEY	545	AC *	
LEXINGTON	437	439	DEL	*SALEM	412	418 E *
LINCOLN	490	D	*SALISBURY	542	A *	
LITTLETON	494	BD	*SAUGUS	386	389 EL *	
LOGAN AIRPORT	193	L	*SCITUATE	536	IM *	
LOWELL	559	B	*SHARON	529	IK *	
LYNN	364	385	E	*SHERBORN	514	FH *
LYNNFIELD	394	395	CE	*SHIRLEY	568	BD *
MALDEN	280	288	EL	*SOMERVILLE	230	244 L *
MANCHESTER	425	C	*SOUTHBOROUGH	508	F *	
MARBLEHEAD	411	E	*STONEHAM	300	302 E *	
MARLBOROUGH	507	F	*STOUGHTON	530	I *	
MARSHFIELD	540	IK	*STOW	497	DF *	
MAYNARD	498	D	*SUDBURY	499	DF *	
MEDFIELD	520	H	*SWAMPSCOTT	362	363 E *	
MEDFORD	269	279	L	*TEWKSBURY	558	BC *
MEDWAY	518	H	*TOPSFIELD	485	C *	
MELROSE	296	299	EL	*TYNSBOROUGH	561	B *
MENDON	577	HJ	*UPTON	575	H *	
MERRIMAC	551	A	*UXBRIDGE	579	HJ *	
METHUEN	554	AB	*WAKEFIELD	390	393 E *	
MIDDLETON	486	C	*WALPOLE	523	H *	
MILFORD	517	H	*WALTHAM	329	339 M *	
MILLIS	519	H	*WATERTOWN	340	343 G *	
MILLVILLE	580	J	*WAYLAND	500	DF *	
MILTON	447	450	IM	*WELLESLEY	426	429 FM *
NAHANT	361	G	*WENHAM	408	C *	
NATICK	510	513	F	*WEST BRIDGEWATER	589	K *
NEEDHAM	432	436	M	*WEST NEWBURY	547	A *
NEWBURY	544	A	*WESTBOROUGH	574	FH *	
NEWBURYPORT	543	A	*WESTFORD	563	BD *	
NEWTON	344	360	G	*WESTON	430	431 F *
NORFOLK	524	H	*WESTWOOD	442	443 HIM*	
NORTH ANDOVER	553	AC	*WEYMOUTH	474	479 I *	
NORTH READING	487	C	*WHITMAN	587	IK *	
NORTHBOROUGH	573	F	*WILMINGTON	488	BCE*	
NORTHBRIDGE	578	H	*WINCHESTER	303	307 EL *	
NORWELL	537	I	*WINTHROP	257	261 L *	
NORWOOD	522	HI	*WOBURN	308	313 EL *	
PEABODY	396	402	CE	*WRENTHAM	527	HJ *
PEMBROKE	539	IK	*			

MAP ZONE/TOWN NAME	CTPS NO	MAP ZONE/TOWN NAME	CTPS NO
A AMESBURY	546	*D HARVARD	569 *
A GROVELAND	548	*D LANCASTER	570 *
A HAVERHILL	552	*D LINCOLN	490 *
A MERRIMAC	551	*D MAYNARD	498 *
A NEWBURY	544	*DE BEDFORD	489 *
A NEWBURYPORT	543	*DEL LEXINGTON	437 439*
A SALISBURY	542	*DF BOLTON	496 *
A WEST NEWBURY	547	*DF CLINTON	571 *
AB BOXFORD	550	*DF HUDSON	506 *
AB DRACUT	557	*DF STOW	497 *
ABC LAWRENCE	555	*DF SUDBURY	499 *
AB METHUEN	554	*DF WAYLAND	500 *
AC GEORGETOWN	549	*E BURLINGTON	409 *
AC NORTH ANDOVER	553	*E LYNN	364 385*
AC ROWLEY	545	*E MARBLEHEAD	411 *
B DUNSTABLE	564	*E SALEM	412 418*
B GROTON	566	*E STONEHAM	300 302*
B LOWELL	559	*E SWAMPSCOTT	362 363*
B PEPPERELL	565	*E WAKEFIELD	390 393*
B TYNSBOROUGH	561	*EL MALDEN	280 288*
BC ANDOVER	556	*EL MELROSE	296 299*
BC TEWKSBURY	558	*EL REVERE	262 268*
BCE WILMINGTON	488	*EL SAUGUS	386 389*
BD AYER	567	*EL WINCHESTER	303 307*
BD BILLERICA	560	*EL WOBURN	308 313*
BD CHELMSFORD	562	*F ASHLAND	509 *
BD LITTLETON	494	*F FRAMINGHAM	501 505*
BD SHIRLEY	568	*F MARLBOROUGH	507 *
BD WESTFORD	563	*F NATICK	510 513*
C ESSEX	482	*F NORTHBOROUGH	573 *
C GLOUCESTER	481	*F SOUTHBOROUGH	508 *
C HAMILTON	483	*F WESTON	430 431*
C IPSWICH	484	*FH DOVER	521 *
C MANCHESTER	425	*FH HOPKINTON	515 *
C MIDDLETON	486	*FH SHERBORN	514 *
C NORTH READING	487	*FH WESTBOROUGH	574 *
C ROCKPORT	480	*FM WELLESLEY	426 429*
C TOPSFIELD	485	*G NAHANT	361 *
C WENHAM	408	*G NEWTON	344 360*
CE BEVERLY	419 424	*G WATERTOWN	340 343*
CE DANVERS	403 407	*H HOLLISTON	516 *
CE LYNNFIELD	394 395	*H HOPEDALE	576 *
CE PEABODY	396 402	*H MEDFIELD	520 *
CE READING	410	*H MEDWAY	518 *
D ACTON	493	*H MILFORD	517 *
D BERLIN	572	*H MILLIS	519 *
D BOXBOROUGH	495	*H NORFOLK	524 *
D CARLISLE	491	*H NORTHBRIDGE	578 *
D CONCORD	492	*H UPTON	575 *

MAP	ZONE/TOWN NAME	CTPS NO	MAP	ZONE/TOWN NAME	CTPS NO
H	WALPOLE	523	*L	WINTHROP	257 261*
HI	NORWOOD	522	*LM	BROOKLINE	245 256*
HIM	WESTWOOD	442 443	*M	HULL	533 *
HJ	BELLINGHAM	526	*M	NEEDHAM	432 436*
HJ	FOXBOROUGH	528	*M	WALTHAM	329 339*
HJ	FRANKLIN	525	*N	BOSTON/ALLSTON-BRHTN	185 192*
HJ	MENDON	577	*N	BOSTON/BACK BAY	029 032*
HJ	UXBRIDGE	579	*N	BOSTON/BEACON HILL	026 028*
HJ	WRENTHAM	527	*N	BOSTON/BEACON HILL	024 *
I	ABINGTON	586	*N	BOSTON/CHARLESTOWN	073 080*
I	AVON	584	*N	BOSTON/EAST BOSTON	061 072*
I	CANTON	444 446	*N	BOSTON/FENWAY-P.HILL	095 098*
I	HANOVER	538	*N	BOSTON/FENWAY-P.HILL	106 109*
I	HOLBROOK	531	*N	BOSTON/FINANCIAL-RET	004 006*
I	NORWELL	537	*N	BOSTON/FINANCIAL-RET	013 *
I	RANDOLPH	463 465	*N	BOSTON/FINANCIAL-RET	001 *
I	ROCKLAND	532	*N	BOSTON/FINANCIAL-RET	011 *
I	STOUGHTON	530	*N	BOSTON/GOV'T CENTER	012 *
I	WEYMOUTH	474 479	*N	BOSTON/GOV'T CENTER	020 022*
IK	BROCKTON	585	*N	BOSTON/GOV'T CENTER	009 010*
IK	DUXBURY	541	*N	BOSTON/GOV'T CENTER	003 *
IK	EASTON	583	*N	BOSTON/HYDE PARK	179 184*
IK	HANSON	591	*N	BOSTON/JAMAICA PLAIN	110 *
IK	MARSHFIELD	540	*N	BOSTON/JAMAICA PLAIN	162 *
IK	PEMBROKE	539	*N	BOSTON/JAMAICA PLAIN	168 174*
IK	SHARON	529	*N	BOSTON/MATTAPAN	157 160*
IK	WHITMAN	587	*N	BOSTON/NO DORCHESTER	131 144*
IM	BRAINTREE	466 473	*N	BOSTON/NORTH END	015 019*
IM	COHASSET	535	*N	BOSTON/NORTH END	023 *
IM	DEDHAM	440 441	*N	BOSTON/NORTH END	025 *
IM	HINGHAM	534	*N	BOSTON/PARK SQUARE	002 *
IM	MILTON	447 450	*N	BOSTON/PARK SQUARE	033 *
IM	QUINCY	451 462	*N	BOSTON/PARK SQUARE	053 054*
IM	SCITUATE	536	*N	BOSTON/PRUDENTIAL	035 *
J	BLACKSTONE	581	*N	BOSTON/PRUDENTIAL	037 043*
J	MILLVILLE	580	*N	BOSTON/ROS LINDALE	163 167*
J	PLAINVILLE	582	*N	BOSTON/ROXBURY	111 130*
K	BRIDGEWATER	590	*N	BOSTON/ROXBURY	161 *
K	EAST BRIDGEWATER	588	*N	BOSTON/ROXBURY	099 105*
K	HALIFAX	592	*N	BOSTON/SO BOSTON	081 094*
K	WEST BRIDGEWATER	589	*N	BOSTON/SO DORCHESTER	145 156*
L	ARLINGTON	322 328	*N	BOSTON/SOUTH END	034 *
L	BELMONT	314 321	*N	BOSTON/SOUTH END	036 *
L	CAMBRIDGE	200 229	*N	BOSTON/SOUTH END	044 052*
L	CHELSEA	194 199	*N	BOSTON/SOUTH END	055 060*
L	EVERETT	289 295	*N	BOSTON/WATERFRONT	014 *
L	LOGAN AIRPORT	193	*N	BOSTON/WATERFRONT	007 008*
L	MEDFORD	269 279	*N	BOSTON/WEST ROXBURY	175 178*
L	SOMERVILLE	230 244	*		*

E. SAMPLE QNET80 DECK SETUP TO RUN UNET/UPATH

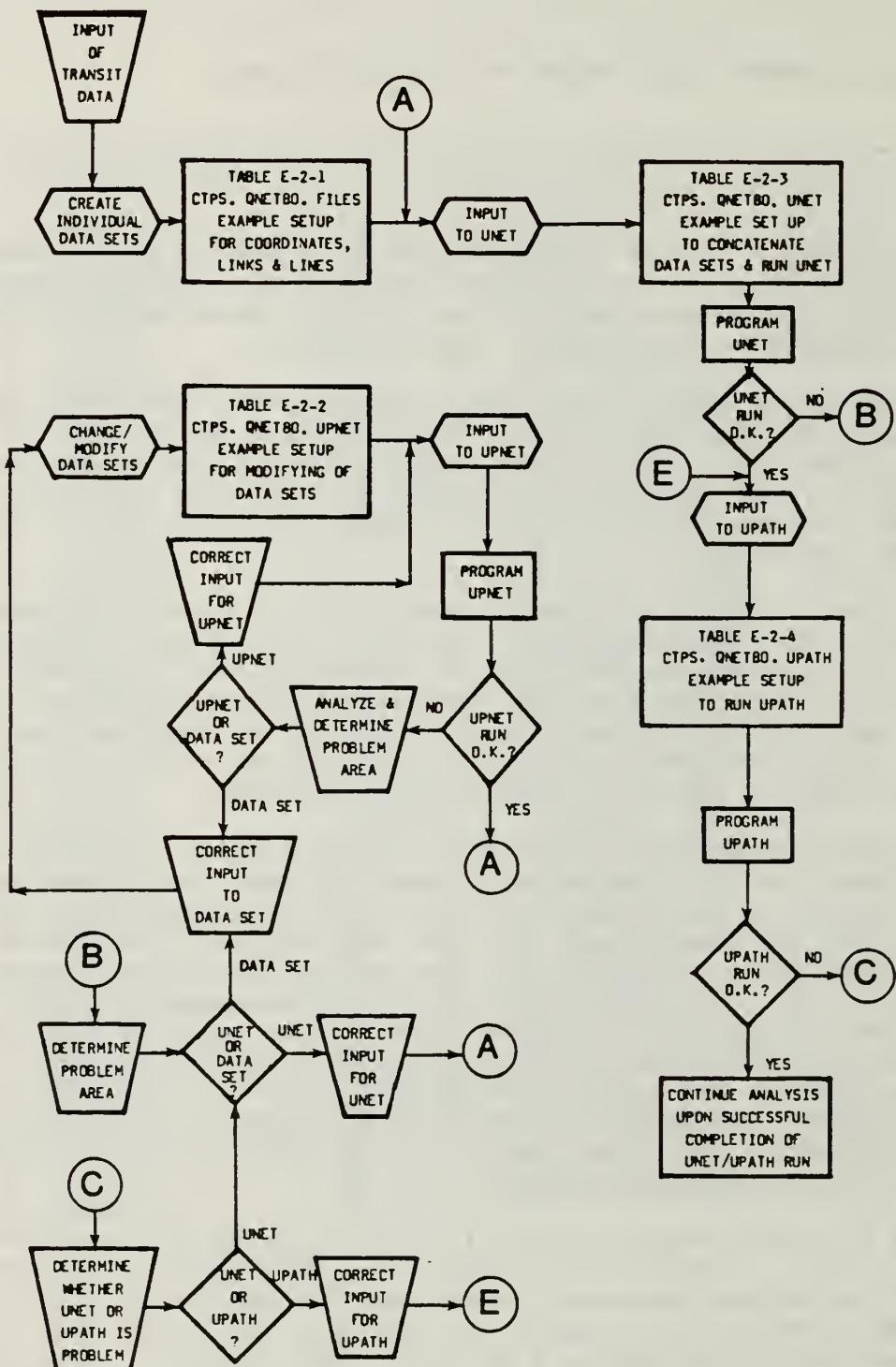
The requirements to use UNET/UPATH UTPS programs may be found in the report "Urban Transportation Planning System, Introduction" (May 1976). Later versions of this report have replaced UNET with INET and have made other changes also.

The flowchart in Figure E-1 shows how the four main sections of the sample deck setups shown in Tables E-1-1 through E-1-4 are related. The four tables show example setups for creating individual data sets, for making changes to existing data sets with the UPNET program, for running the UNET program, and for running the UPATH programs.

The data sets of coordinates, links, and lines may be created by using the UTILITIES program of IEBGENER, as shown in Table E-1-1. The coordinate data set is not required for UNET/UPATH as long as PLOT programs are not requested. These data sets may be created individually or as one data set if so desired, and the various procedures necessary to create the single data set for UNET will depend upon the base data sets used.

In the three IEBGENER formats for creating the three data sets, it is noted that '9' cards are placed between the three data sets. This is a requirement of the UNET program. The three data sets (or two data sets, as the case may be) are contiguous to the section STEPHEAD just prior to the execution of the program UNET. In Table E-1-2, the updating of the UNET data set is shown. This program is included as a method that may be used to add, modify, or change the coordinate, link, or line file as desired. Complete details for program UPNET may be found in "CTPS Software User's Guide." It should be noted that UPNET will replace the exact link card only, designated in ANODE/BNODE order (it does not test for BNODE/ANODE order).

The main data set may be maintained as a permanent data set on disk (or tape). Thus, by concatenating the various separate data sets in the proper sequence, with the STEPHEAD data set, a temporary data set may be created to operate UNET with the selected OPTION and SELECT parameters as input for the run. The example in Table E-1-3 shows UNET run individually, and the example in Table E-1-4 shows how the data set created by UNET is used as part of the input to run UPATH. Both UNET and UPATH can be run in sequential order in one run. Generally, UNET should be run first alone to determine if any LINK or LINE errors exist in the network files. Upon obtaining an error-free data set, the UPATH program may be used to obtain the desired paths.



```
-----  
CTPS.QNET80.FILES  
-----  
@  
/*-----  
//SCRATCHX EXEC PGM=IEFBR14  
//COORFILE DD UNIT=DISK,VOL=SER=DSK36C,DISP=(OLD,DELETE),  
// DSNAME=CTPS.NEW.QNET80.COORDS  
/*-----  
//*****  
//STEPCOOR EXEC PGM=IEBGENER  
//SYSPRINT DD SYSOUT=R  
//SYSUT2 DD UNIT=DISK,VOL=SER=DSK36C,DISP=(NEW,KEEP),  
// SPACE=(TRK,(1,1),RLSE),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),  
// DSNAME=CTPS.NEW.QNET80.COORDS  
//SYSIN DD DUMMY  
/* ----SAMPLE COORDINATE DATA SET INPUT-----  
//SYSUT1 DD *  
4 1 718400 494000  
4 2 717900 493000  
.  
. .  
4 8191 731300 632200  
/* END OF COORDINATE DATA  
//*****  
// A NINE CARD IS REQUIRED BETWEEN DATA SETS  
//*****  
//SCRATCHX EXEC PGM=IEFBR14  
//LINKFILE DD UNIT=DISK,VOL=SER=DSK36C,DISP=(OLD,DELETE),  
// DSNAME=CTPS.NEW.QNET80.LINKS  
/*-----  
//STEPLINK EXEC PGM=IEBGENER  
//SYSPRINT DD SYSOUT=R  
//SYSUT2 DD UNIT=DISK,VOL=SER=DSK36C,DISP=(NEW,KEEP),  
// SPACE=(TRK,(1,1),RLSE),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),  
// DSNAME=CTPS.NEW.QNET80.LINKS  
//SYSIN DD DUMMY  
/* ----SAMPLE LINK DATA SET INPUT-----  
//SYSUT1 DD *  
99999999  
1 8062 1806 3 15 80 80 602  
. .  
1 7778 3866 3 101 230 230 1502  
/* END OF LINKS DATA
```

```
//*****  
//* A NINE CARD IS REQUIRED BETWEEN DATA SETS  
//*****  
//SCRATCHX EXEC PGM=IEFBR14  
//LINEFILE DD UNIT=DISK,VOL=SER=DSK36C,DISP=(OLD,DELETE),  
// DSNAME=CTPS.NEW.QNET80.LINES  
/*  
//*****  
//STEPLINE EXEC PGM=IEBGENER  
//SYSPRINT DD SYSOUT=R  
//SYSUT2 DD UNIT=DISK,VOL=SER=DSK36C,DISP=(NEW,KEEP),  
// SPACE=(TRK,(1,1),RLSE),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),  
// DSNAME=CTPS.NEW.QNET80.LINES  
//SYSIN DD DUMMY  
//* ----SAMPLE LINE DATA SET INPUT-----  
//SYSUT1 DD *  
999999  
2 5 1012 55 55 90      1870 1869 1868 1867 1866 1850 1849 1848 1847  RED LINE  
2 5 1022      1846 1845 1865 1864 1863 1872 1873 1874      T RED LINE  
.  
  
2 7194212120100300      2516 5853 5846 6055 2519 5844 2624 1874 2622  8  
2 719422      2621 5260 5261 2263 5255 5248 1863      T 8  
/*  
//  
@  
END OF LINK DATA
```

②
③

```
/*-----  
/* COPY OF UPNET LINK CHANGES FOR QNET80  
/*-----  
//UPNET PROC CORE=120K,XTIME=30,CLASS=M,OLDNET=DUMMY,NEWNET=DUMMY      00000010  
//** CTPS PROCEDURE FOR 'UPNET'                                         00000020  
//UPNET EXEC PGM=UPNET,REGION=&CORE,TIME=&XTIME                         00000030  
//STEPLIB DD DSNAME=CTPS.PROGLIB,UNIT=DISK,                                00000040  
//          DISP=(SHR,CATLG),VOL=SER=DSK36C  
//FT01F001 DD DDNAME=SYSIN                                              00000050  
//FT02F001 DD &OLDNET,DISP=(OLD,PASS)                                     00000060  
//FT03F001 DD &NEWNET,DISP=(,KEEP),                                         00000070  
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200)                           00000080  
//FT06F001 DD SYSOUT=&CLASS                                            00000090  
//FT30F001 DD DSNAME=CTPS.PRGLOG,UNIT=DISK,                                00000100  
//          DISP=(SHR,CATLG),VOL=SER=DSK36C  
//SORTLIB DD DSNAME=SYS1.SORTLIB,DISP=SHR,UNIT=DISK                         00000110  
//SYSOUT  DD SYSOUT=&CLASS                                             00000120  
//SYSOUT2 DD SYSOUT=&CLASS                                             00000130  
//SYSPRINT DD SYSOUT=&CLASS                                            00000140  
//SORTWK01 DD UNIT=DISK,SPACE=(CYL,(1,1)),DISP=(,DELETE),DSNAME=&WK01    00000150  
//SORTWK02 DD UNIT=DISK,SPACE=(CYL,(1,1)),DISP=(,DELETE),DSNAME=&WK02    00000160  
//SORTWK03 DD UNIT=DISK,SPACE=(CYL,(1,1)),DISP=(,DELETE),DSNAME=&WK03    00000170  
//PROCEND PEND  
*****  
//SCRTCH EXEC PGM=IEFBR14  
//A       DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),  
//          DSNAME=CTPS.NEW.QNET80.ALADATA.NOHEAD.UPNET  
*****  
//UPDATEXX EXEC PGM=UPNET  
//STEPLIB  DD DSN=CTPS.PROGLIB,DISP=SHR,UNIT=DISK,VOL=SER=DSK36C  
//SORTLIB  DD DSN=SYS1.SORTLIB,DISP=SHR  
//FT30F001 DD DSN=CTPS.PRGLOG,DISP=SHR,UNIT=DISK,VOL=SER=DSK36C  
//SYSOUT   DD SYSOUT=R  
//SYSOUT2  DD SYSOUT=R  
//SYSPRINT DD SYSOUT=R  
//SORTWK01 DD UNIT=DISK,SPACE=(CYL,(2,1)),DSN=&KTEMP1,DISP=(NEW,PASS)  
//SORTWK02 DD UNIT=DISK,SPACE=(CYL,(2,1)),DSN=&KTEMP2,DISP=(NEW,PASS)  
//SORTWK03 DD UNIT=DISK,SPACE=(CYL,(2,1)),DSN=&KTEMP3,DISP=(NEW,PASS)
```

```
//FT02F001 DD DISP=(OLD,KEEP),
//    UNIT=DISK,VOL=SER=DSK36C,
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=8000),
//    DSNAME=CTPS.NEW.QNET80.ALADATA.NOHEAD
//*****+
//FT03F001 DD UNIT=DISK,VOL=SER=TEMPO1,DISP=(NEW,KEEP),
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),
//    SPACE=(TRK,(10,10),RLSE),
//    DSNAME=CTPS.KIN.QNET80.ALADATA.NOHEAD.UPNET
//FT06F001 DD SYSOUT=R
/** ADD THE INPUT DATA IN FT01F001 FOR CORRECTIONS TO THE DATA SET
/** INSERT LINK CARDS TO BE UPDATED AFTER THE FT01F001 CARD
/** COLUMN 12 UPNET EDITING***BLANK ADD***R REPLACE***D DELETE*
/** LINE CARDS ARE ADDED UPNET CORRECTION IN COLUMN 9
/** O' DELETE**1 ONEWAY ADD**2 TWOWAY ADD**3 ONEWAY REPLACE**
/**4 TWOWAY REPLACE**FOR LINE UPDATE
/**-----V--V-----
1 164 1805D1
1 1863 1872 5      10     13     13    132          RED EXT PORTER SQ
1 5370 5369R7        1      5      5     42
.
.
2 5 314 55 55 90      1874 1873 1872 1863 1864 1865 1845 1846 1847    RED ASHM
2 5 324            1848 1849 1850 1851 1852 1853 1854 1855    TRED ASHM
.
.
2 719110
/*
//*****+
@
```

```
/*-----  
/* COPY OF UPNET LINK CHANGES FOR QNET80  
/*-----  
*****STEPHEAD AND UNET SECTIONS TO FOLLOW*****  
/* ERASE OLD DATA SET TO CREATE A NEW DATA SET FILE*****  
/*-----  
/*  
//SCRATCHX EXEC PGM=IEFBR14  
//HEADFILE DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),  
// DSNAME=CTPS.NEW.UNET80.HEADER  
/*-----  
//CLEARNET EXEC PGM=IEHPROGM  
//SYSPRINT DD SYSOUT=R  
//TEMP01 DD VOL=SER=TEMP01,DISP=OLD,UNIT=DISK  
//DSK36C DD VOL=SER=DSK36C,DISP=OLD,UNIT=DISK  
//SYSIN DD *  
SCRATCH DSNAME=CTPS.NEW.QNET80.UNET.LINES,VOL=DISK=TEMP01  
SCRATCH DSNAME=CTPS.NEW.QNET80.UNET.FREQTABL,VOL=DISK=TEMP01  
SCRATCH DSNAME=CTPS.NEW.QNET80.UNETLINKS,VOL=DISK=TEMP01  
SCRATCH DSNAME=CTPS.NEW.QNET80.UNET.ANOTTABL,VOL=DISK=TEMP01  
SCRATCH DSNAME=CTPS.NEW.QNET80.UNET.COORDS,VOL=DISK=TEMP01  
/*-----  
*****  
/*-----  
//UNET PROC LIB='BTPD.URD81.PROGLIB',UNITLIB='DISK,VOL=SER=DSK34F',  
// CLASS=A,CORE=200K,UNITS1='DISK,VOL=SER=DSK36C',  
// ONET=DUMMY,UNITONE='DISK,VOL=SER=DSK36C',  
// NNET=DUMMY,UNITNNE='DISK,VOL=SER=DSK36C',  
// UNITS2='DISK,VOL=SER=DSK36C',UNITS3='DISK,VOL=SER=DSK36C',  
// UNITS4='DISK,VOL=SER=DSK36C',UNITS5='DISK,VOL=SER=DSK36C',  
// PLOTTER=DUMMY,UNITPLO='DISK,VOL=SER=DSK36C'  
//UNET EXEC PGM=UNET,REGION=&CORE  
/* UMTA PROCEDURE FOR UNET  
/* BUILD OR UPDATE TRANSIT NETWORKS  
/* UMTA - G55001 -GIBSON -426-9271 -577  
//STEPLIB DD UNIT=&UNITLIB,DSN=&LIB,DISP=(SHR,PASS) PROGLIB  
//FT01F001 DD &NNET,UNIT=&UNITNNE,DISP=(,KEEP), LINES  
// DCB=(RECFM=VBS,LRECL=2004,BLKSIZE=2008)  
//FT01F002 DD &NNET,UNIT=&UNITNNE,DISP=(,KEEP), FREQ  
// DCB=*.FT01F001  
//FT01F003 DD &NNET,UNIT=&UNITNNE,DISP=(,KEEP), LINKS  
// DCB=*.FT01F001
```

```
//FT01F004 DD &NNET,UNIT=&UNITNNE,DISP=(,KEEP),          ANODE
//          DCB=*.FT01F001
//FT01F005 DD &NNET,UNIT=&UNITNNE,DISP=(,KEEP),          COORD
//          DCB=*.FT01F001
//FT05F001 DD DDNAME=SYSIN
//FT06F001 DD SYSOUT=&CLASS
//FT08F001 DD UNIT=&UNITS2,SPACE=(TRK,(20,10)),          SCR2
//          DCB=(RECFM=VBS,LRECL=2004,BLKSIZE=2008)
//FT09F001 DD UNIT=&UNITS3,SPACE=(TRK,(10,10)),          SCR3
//          DCB=*.FT08F001
//FT10F001 DD UNIT=&UNITS4,SPACE=(TRK,(20,10)),          SCR4
//          DCB=*.FT08F001
//FT11F001 DD UNIT=&UNITS5,SPACE=(TRK,(20,10)),          SCR5
//          DCB=*.FT08F001
//FT12F001 DD &ONET,UNIT=&UNITONE,DISP=(OLD,KEEP)
//FT13F001 DD &ONET,UNIT=&UNITONE,DISP=(OLD,KEEP)
//FT14F001 DD &ONET,UNIT=&UNITONE,DISP=(OLD,KEEP)
//FT15F001 DD &ONET,UNIT=&UNITONE,DISP=(OLD,KEEP)
//FT16F001 DD &ONET,UNIT=&UNITONE,DISP=(OLD,KEEP)
//FT20F001 DD UNIT=&UNITS1,SPACE=(TRK,(1,1)),          SCR1
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=800),DISP=(,PASS)
//*T21F001 DD DSN=URD81.LOG,DISP=SHR
//FT21F001 DD DUMMY
//FT49F001 DD DSN=&&FT49,UNIT=DISK,SPACE=(TRK,(1,1)),
//          DISP=(,PASS),DCB=(RECFM=F,LRECL=80,BLKSIZE=80)
//UPL0T1 EXEC PGM=UPL0T,COND=(3,NE,UNET),REGION=&CORE
//*          UMTA PROCEDURE FOR UPL0T
//*          PLOT NETWORKS AND PATHS
//*          EXECUTED ONLY WHEN UNET ISSUES A RC=3
//*          * - A PLOT ONLY RUN - *
//STEPLIB  DD DSN=&LIB,UNIT=&UNITLIB,DISP=(SHR,PASS)      PROGLIB
//FT01F001 DD &ONET,UNIT=&UNITONE,DISP=(SHR,KEEP)
//FT01F002 DD &ONET,UNIT=&UNITONE,DISP=(SHR,KEEP)
//FT01F003 DD &ONET,UNIT=&UNITONE,DISP=(SHR,KEEP)
//FT01F004 DD &ONET,UNIT=&UNITONE,DISP=(SHR,KEEP)
//FT01F005 DD &ONET,UNIT=&UNITONE,DISP=(SHR,KEEP)
//FT05F001 DD DSN=*.UNET.FT20F001,DISP=(OLD,DELETE)
//FT06F001 DD SYSOUT=&CLASS
//FT20F001 DD UNIT=&UNITS1,SPACE=(TRK,(1,1)),          SCR1
//          DCB=(RECFM=FB,LRECL=72,BLKSIZE=720)
//*T21F001 DD DSN=URD81.LOG,DISP=SHR
//FT21F001 DD DUMMY
//FT22F001 DD &PLOTTER,DISP=(NEW,KEEP),UNIT=&UNITPLO
//FT23F001 DD SYSOUT=&CLASS,DCB=(RECFM=FA,BLKSIZE=133)
//PLOTTAPE DD &PLOTTER,DISP=(NEW,KEEP),UNIT=&UNITPLO
```

```
//FT49F001 DD DSN=&&FT49,DISP=(OLD,PASS),UNIT=DISK
//UPL0T2 EXEC PGM=UPL0T,COND=(4,NE,UNET),REGION=&CORE
//**          UMTA PROCEDURE FOR UPL0T
//**          PLOT NETWORKS AND PATHS
//**          EXECUTED ONLY WHEN UNET ISSUES A RC=4
//**          * - A NETWORK BUILD OR UPDATE RUN
//STEPLIB   DD DSN=&LIB,UNIT=&UNITLIB,DISP=(SHR,PASS)           PROGLIB
//FT01F001  DD &NNET,UNIT=&UNITNNE,DISP=(SHR,KEEP)
//FT01F002  DD &NNET,UNIT=&UNITNNE,DISP=(SHR,KEEP)
//FT01F003  DD &NNET,UNIT=&UNITNNE,DISP=(SHR,KEEP)
//FT01F004  DD &NNET,UNIT=&UNITNNE,DISP=(SHR,KEEP)
//FT01F005  DD &NNET,UNIT=&UNITNNE,DISP=(SHR,PASS),LABEL=5
//FT05F001  DD DSN=*.UNET.FT20F001,DISP=(OLD,DELETE)
//FT06F001  DD SYSOUT=&CLASS
//FT20F001  DD UNIT=&UNITS1,SPACE=(TRK,(1,1)),      SCR1
//          DCB=(RECFM=FB,LRECL=72,BLKSIZE=720)
//*T21F001  DD DSN=URD81.LOG,DISP=SHR
//FT21F001  DD DUMMY
//FT22F001  DD &PLOTTER,DISP=(NEW,KEEP),UNIT=&UNITPLO
//FT23F001  DD SYSOUT=&CLASS,DCB=(RECFM=FA,BLKSIZE=133)
//PLOTTAPE  DD &PLOTTER,DISP=(NEW,KEEP),UNIT=&UNITPLO
//FT49F001  DD DSN=&&FT49,DISP=(OLD,PASS),UNIT=DISK
//PROCEND  PEND
*****STEPHEAD EXEC PGM=IEBGENER
//SYSPRINT  DD SYSOUT=R
//SYSUT2    DD UNIT=DISK,VOL=SER=TEMPO1,DISP=(NEW,PASS),
//          SPACE=(TRK,(1,1),RLSE),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),
//          DSNAME=CTPS.NEW.UNET80.HEADER
//SYSIN    DD DUMMY
//SYSUT1   DD *
       CTPS.NEW.QNET80.ALADATA.NOHEAD.NEWUNET
       NEW UNET FILE IS CREATED WITH UPNET CHANGES SHOWN ABOVE
*****
&PARAM NODES=8191,ZONES=592,LENAM=2,LENPM=11,LENNIT=5,
TIMCST(7)=1764,DSTCST(7)=74                         &END
&OPTION AM=T,BUILD=T                               &END
&SELECT REPORT=2,5                                &END
&DATA
/*
*****DATA SET CONCATENATION*****
//*****
//STEPU0T   EXEC PGM=IEBGENER
//SYSPRINT  DD SYSOUT=R
```

```
//SYSUT2      DD DSN=&XNET,UNIT=DISK,SPACE=(TRK,(120,12),RLSE,CONTIG),
//    VOL=SER=TEMP01,
//    DISP=(NEW,PASS),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200)
//SYSIN       DD DUMMY
//SYSUT1      DD DSN=CTPS.NEW.UNET80.HEADER,
//    VOL=SER=TEMP01,UNIT=DISK,DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),
//    DISP=(OLD,DELETE)
//          DD DSNAME=CTPS.NEW.QNET80.ALADATA.NOHEAD.NEWUNET,
//    VOL=SER=DSK36C,UNIT=DISK,DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200),
//    DISP=(OLD,KEEP)
*****START PROGRAM UNET*****
*****UPON SUCCESSFUL COMPLETION OF ABOVE UNET RUN*****
//UNETRTAM    EXEC UNET,CLASS=A
//UNET.FT01F001 DD DSNAME=CTPS.NEW.QNET80.UNET.LINES,
//    VOL=SER=TEMP01,UNIT=DISK,DISP=(NEW,KEEP),SPACE=(TRK,(6,6),RLSE)
//UNET.FT01F002 DD DSNAME=CTPS.NEW.QNET80.UNET.FREQTABL,
//    VOL=SER=TEMP01,UNIT=DISK,DISP=(NEW,KEEP),SPACE=(TRK,(12,6),RLSE)
//UNET.FT01F003 DD DSNAME=CTPS.NEW.QNET80.UNET.LINKS,
//    VOL=SER=TEMP01,UNIT=DISK,DISP=(NEW,KEEP),SPACE=(CYL,(10,1),RLSE)
//UNET.FT01F004 DD DSNAME=CTPS.NEW.QNET80.UNET.ANODTABL,
//    VOL=SER=TEMP01,UNIT=DISK,DISP=(NEW,KEEP),SPACE=(TRK,(12,6),RLSE)
//UNET.FT01F005 DD DSNAME=CTPS.NEW.QNET80.UNET.COORDS,
//    VOL=SER=TEMP01,UNIT=DISK,DISP=(NEW,KEEP),SPACE=(TRK,(12,6),RLSE)
//UNET.FT05F001 DD DSNAME=&XNET,
//    VOL=SER=TEMP01,
//    UNIT=DISK,DISP=(OLD,PASS),DCB=(RECFM=FB,LRECL=80,BLKSIZE=7200)
/*
*****START UPATH PROGRAM*****
*****UPON SUCCESSFUL COMPLETION OF ABOVE UNET RUN*****
//  
e
```

```
/*
*****UPATH PROGRAM PROC*****
*/
/*-----*
//UPATH PROC CLASS=A,                                00000100
//      CORE=256K,                                 00000200
//      LIB='BTPD.URD81.PROGLIB', UNITLIB='DISK, VOL=SER=DSK34F', 00000300
//      NET=DUMMY, UNITNET='DISK, VOL=SER=DSK36C',          00000400
//      PATH=DUMMY, UNITPAT='DISK, VOL=SER=DSK36C',          00000500
//      J1=DUMMY, UNITJ1='DISK, VOL=SER=DSK36C',           00000600
//      UNITSCR=DISK                                     00000700
//*****                                              00000800
//** UTPS PROCEDURE FOR UPATH - 12DEC82             *
//** TO BUILD TRANSIT PATHS AND IMPEDANCE MATRICES   *
//** CONTACT: UTPS SUPPORT CENTER (800) 638-8747     *
//*****                                              00001200
//** SYMBOLIC REFERENCES                            *
//** * * * * * * * * * * * * * * * * * * * * * * * * * * * 00001300
//** CLASS = SYSOUT PRINT CLASS                   *
//** CORE = REGION SIZE                         *
//** LIB = NAME OF PROGRAM LIBRARY               *
//** NET = INPUT TRANSIT NETWORK THROUGH WHICH PATHS  *
//**       OF MINIMUM IMPEDANCE ARE TO BE FOUND.        *
//**       NET IS USUALLY IN 4-FILE TAPE FORMAT.        *
//** PATH = TRANSIT PATH FILE TO BE CREATED         *
//** J1 = OUTPUT MATRIX FILE CONTAINING TRANSIT DISTANCE, *
//**       FARE AND IMPEDANCE SKIM TABLES AS REQUESTED.  *
//*****                                              00002400
//** DATA CARD FILES                             *
//** * * * * * * * * * * * * * * * * * * * * * * * * * * * 00002500
//** SYSIN = UPATH CONTROL CARDS, AND OPTIONALLY,    *
//**       TRANSIT FARE LINK CARDS                  *
//*****                                              00002900
//*
//*
//*/UPATH EXEC PGM=UPATH,REGION=&CORE                00003100
//STEPLIB DD DSN=&LIB,UNIT=&UNITLIB,DISP=SHR          00003200
//FT01F001 DD &NET,UNIT=&UNITNET,DISP=SHR            00003300
//FT02F001 DD &NET,UNIT=&UNITNET,DISP=SHR,LABEL=2      00003400
//                                         00003500
//                                         00003600
```

```
//FT03F001 DD &NET,UNIT=&UNITNET, 00003700
//          DISP=SHR,LABEL=3 00003800
//FT04F001 DD &NET,UNIT=&UNITNET, 00003900
//          DISP=SHR,LABEL=4 00004000
//FT05F001 DD DDNAME=SYSIN 00004100
//FT06F001 DD SYSOUT=&CLASS 00004200
//FT09F001 DD &PATH,UNIT=&UNITPAT,DISP=(,KEEP), 00004300
//          DCB=(RECFM=VBS,LRECL=2004,BLKSIZE=2008) 00004400
//FT10F001 DD UNIT=&UNITSCR,SPACE=(TRK,(1,1)), 00004500
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=800) 00004600
//FT11F001 DD &J1,UNIT=&UNITJ1,DISP=(,KEEP), 00004700
//          DCB=(RECFM=VBS,LRECL=1604,BLKSIZE=1608) 00004800
//FT12F001 DD UNIT=&UNITSCR,SPACE=(TRK,(19,19)), 00004900
//          DCB=*.FT09F001 00005000
//FT13F001 DD UNIT=&UNITSCR,SPACE=(TRK,(19,19)), 00005100
//          DCB=*.FT09F001 00005200
//FT20F001 DD UNIT=&UNITSCR,SPACE=(TRK,(1,1)), 00005300
//          DCB=(RECFM=FB,LRECL=72,BLKSIZE=720) 00005400
//*T21F001 DD DSN=URD81.LOG,DISP=SHR 00005500
//FT21F001 DD DUMMY 00005500
// PEND
//*****
//SCRATCHX EXEC PGM=IEFBR14
//PATHFILE DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.AMPATHS
//LINKFILE DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.LINKFILE
//ALOCFILE DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.ALOCFILE
//PATHSKMS DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.PATHSKMS
//FTRANSIT DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.FTRANSIT
//RAWFARES DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.RAWFARES
//TRANSITF DD UNIT=DISK,VOL=SER=TEMP01,DISP=(OLD,DELETE),
//          DSNAME=CTPS.NEW.QNET80.TRANSIT.FARES
/*
//*****
//*** ADD OUTLIM=4000 TO LIMIT NO OF LINES OF OUTPUT DURING TEST
//*****
```

```
//UPATHRUN EXEC UPATH,
//      TIME=1440,NET='VOL=SER=TEMPO1',UNITNET=DISK,
//      CLASS='A',OUTLIM=4000',
//      PATH='DSN=CTPS.NEW.QNET80.AMPATHS',UNITPAT=DISK
//*****
//UPATH.FT01F001 DD DSN=CTPS.NEW.QNET80.UNET.LINES
//*****
//UPATH.FT02F001 DD DSN=CTPS.NEW.QNET80.UNET.FREQTABL
//*****
//UPATH.FT03F001 DD DSN=CTPS.NEW.QNET80.UNET.LINKS
//*****
//UPATH.FT04F001 DD DSN=CTPS.NEW.QNET80.UNET.ANOTTABL
//*****
//UPATH.FT09F001 DD SPACE=(TRK,(60,30),RLSE),VOL=SER=TEMPO1,
//      DISP=(NEW,KEEP)
//*****
//UPATH.FT11F001 DD UNIT=DISK,DISP=(NEW,KEEP,DELETE),VOL=SER=TEMPO1,
//      SPACE=(TRK,(10,10),RLSE),DSN=CTPS.NEW.QNET80.RAWFARES
//*****
//UPATH.FT12F001 DD UNIT=DISK,DISP=(NEW,KEEP,DELETE),VOL=SER=TEMPO1,
//      SPACE=(TRK,(25,10),RLSE),DSN=CTPS.NEW.QNET80.LINKFILE
//*****
//UPATH.FT13F001 DD UNIT=DISK,DISP=(NEW,KEEP,DELETE),VOL=SER=TEMPO1,
//      SPACE=(TRK,(25,10),RLSE),DSN=CTPS.NEW.QNET80.ALOCFILE
//*****
//UPATH.SYSIN DD *
**UPATH EXAMPLE SETUP
PRINT OUT OF SAMPLE PATHS 1, 100, 193 AND 592
&PARAM
  XFERS=4,
  WMIN=0.0,0.0,0.0,1.0,1.0,1.0,1.0,1.0,
  XMIN=0.0,0.0,0.0,1.0,1.0,1.0,1.0,1.0,
  WMAX=0.0,0.0,0.0,20.0,20.0,20.0,20.0,20.0,
  XMAX=0.0,0.0,0.0,20.0,20.0,20.0,20.0,20.0,
  WADD=0.0,0.0,0.0,2.0,2.0,2.0,2.0,2.0,
  XADD=0.0,0.0,0.0,2.0,2.0,2.0,2.0,2.0,
  CXTIME=0.0,0.0,0.0,1.0,1.0,1.0,1.0,1.0,
  CWTIME=0.0,0.0,0.0,1.0,1.0,1.0,1.0,1.0,
  CTTIME=0.1,1.0,1.0,1.0,1.0,1.0,1.0,1.0,
  CDIST(1)=8*1.0
&END
```

```
&OPTION
AM=T,
NOX(1,2)=2*T,NOX(1,3)=2*T,
NOX(2,1)=2*T,NOX(2,3)=T,NOX(2,4)=T,NOX(2,5)=T,NOX(2,6)=T,
NOX(2,7)=T,NOX(2,8)=T,
NOX(3,2)=T,
NOX(4,2)=T,
NOX(6,3)=2*T,
NOX(8,8)=T,
PRINDT=T
&END
&SELECT
REPORT=3,
I=1,-592,
IMPED='TRANS IMPED',
PRINT=1,100,193,592
&END
/*
//*****END OF UPATH PROGRAM*****
*/
@
```

F. ALLIED PROGRAMS DEVELOPED AND USED IN CONJUNCTION WITH NETWORK

A number of special computer programs were developed to produce the final data sets required for the UTPS program UNET. These special programs produced link data consistent with the highway network data as to speed and link distances. For example, many of the bus routes coincide with the main thoroughfares of the local areas, except for some minor excursions to side streets. Excursions to some side streets, hence, the speed and distance for the UNET links should be consistent with the actual highway speeds (factored when appropriate for bus route operation). Express buses were assigned the same speed as the highway speed for the time period involved. Local bus speeds were determined from the UMTA characteristics given in Section III-2 of the UTPS Network Development Manual.

Other CTPS computer programs of value for network changes include:

MISNODE: Program to determine node numbers not in use. Note: UNET also lists node numbers not used, but for ANODE usage only.

UPNET: To edit coordinates, links, and lines in a data set already on disk. This program is valuable for changing, correcting, or adding to a data set already in the computer system. See section 5.3.2.

RECMNG: Used to select particular records from a data set on disk. Records up to 250 bytes in length may be selected and up to four selected byte columns of the record may be the basis of selection. For example, to select only LINK cards, select cards with 'l' in column 1. Care must be exercised in the selection of the byte columns. This program is especially useful whenever all records are of similar format, such as link cards. An example is given in section 5.3.3. For further details, see the write-up on general purpose subroutines and utility programs in the CTPS Software User's Guide.

